

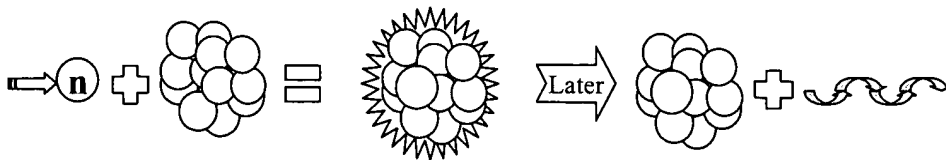
(a) Prompt Gamma Neutron Activation Analysis



Neutron + nucleus = nucleus with extra neutron + characteristic gamma ray

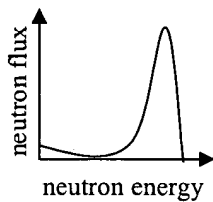
The photon (gamma) that is emitted has a characteristic wavelength (color) that identifies the element.

(b) Delayed Gamma Neutron Activation Analysis



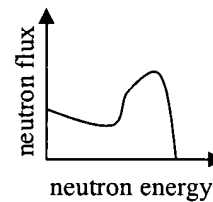
Neutron + nucleus = activated nucleus with extra neutron
which emits a characteristic gamma ray when it decays

Bulk Material Property Analysis with Neutrons



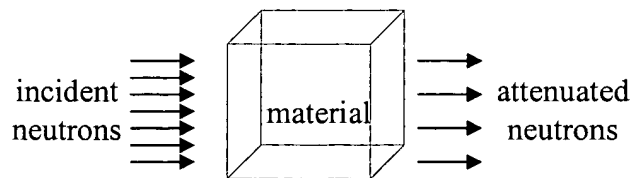
(c) Neutron Energy before Entering Material

(slight energy scattering due to neutrons passing through neutron generator)



(d) Neutron Energy after Passing through Material

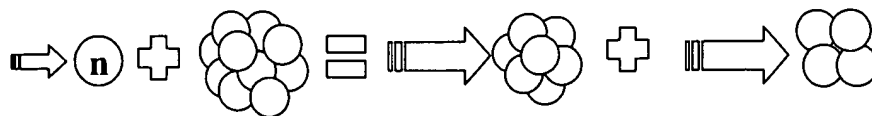
(marked energy scattering due to material properties)



(e) By comparing neutron fluxes before and after passing through the material, various material properties can be calculated, including density, thickness, porosity, and moisture content.

Fig. 3.

10058561.012800
2022.09.19 09:58:50



Thermal Neutron + Boron-10 = Energetic Lithium-7 + Energetic Alpha

Fig. 4a.

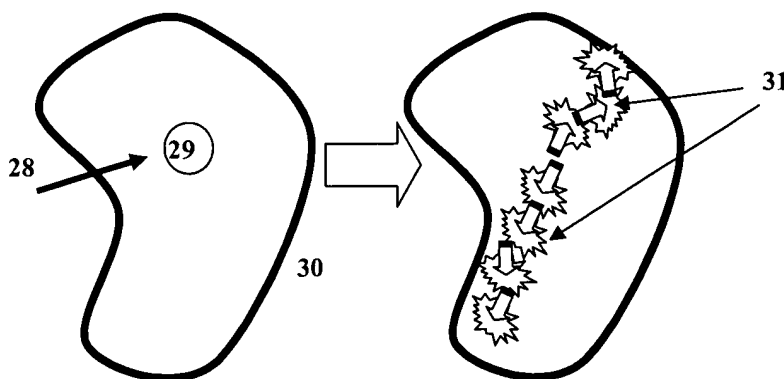


Fig. 4b.

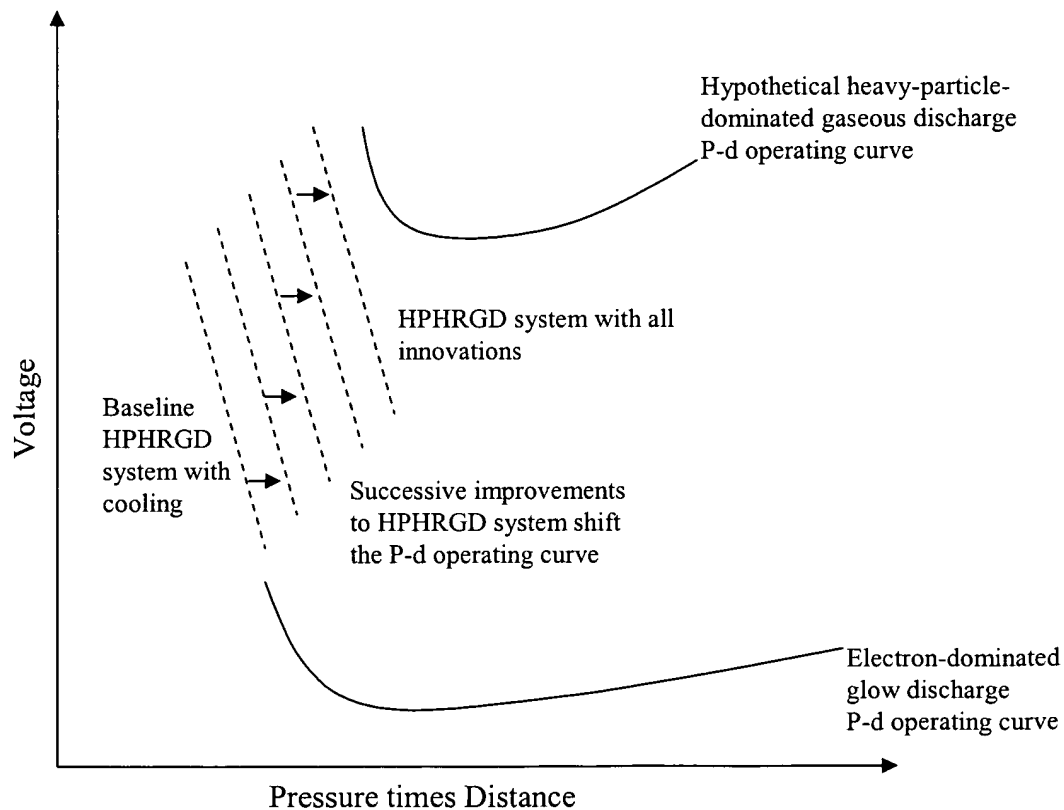


Fig. 5.

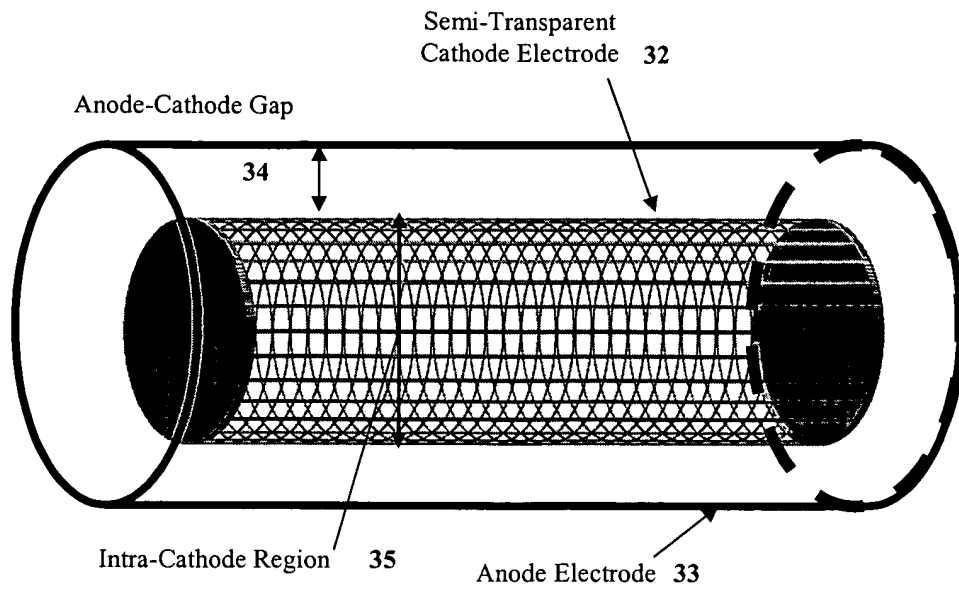


Fig. 6.

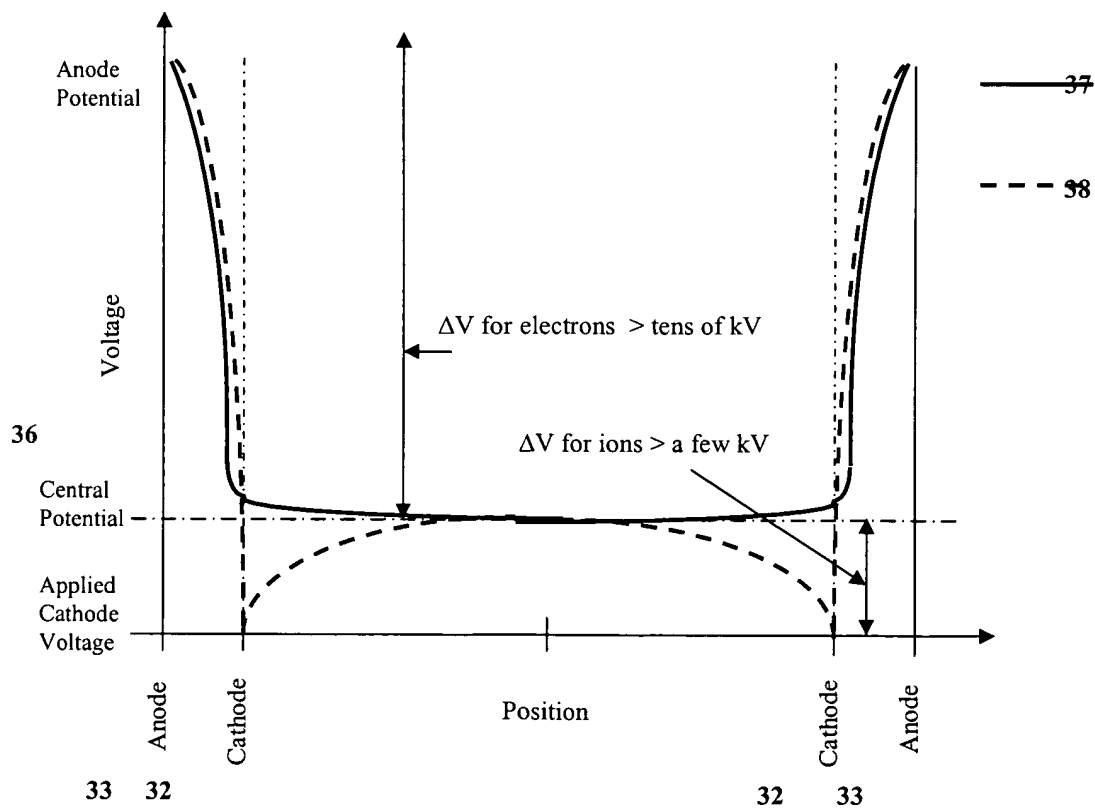


Fig. 8.

10058561-012802

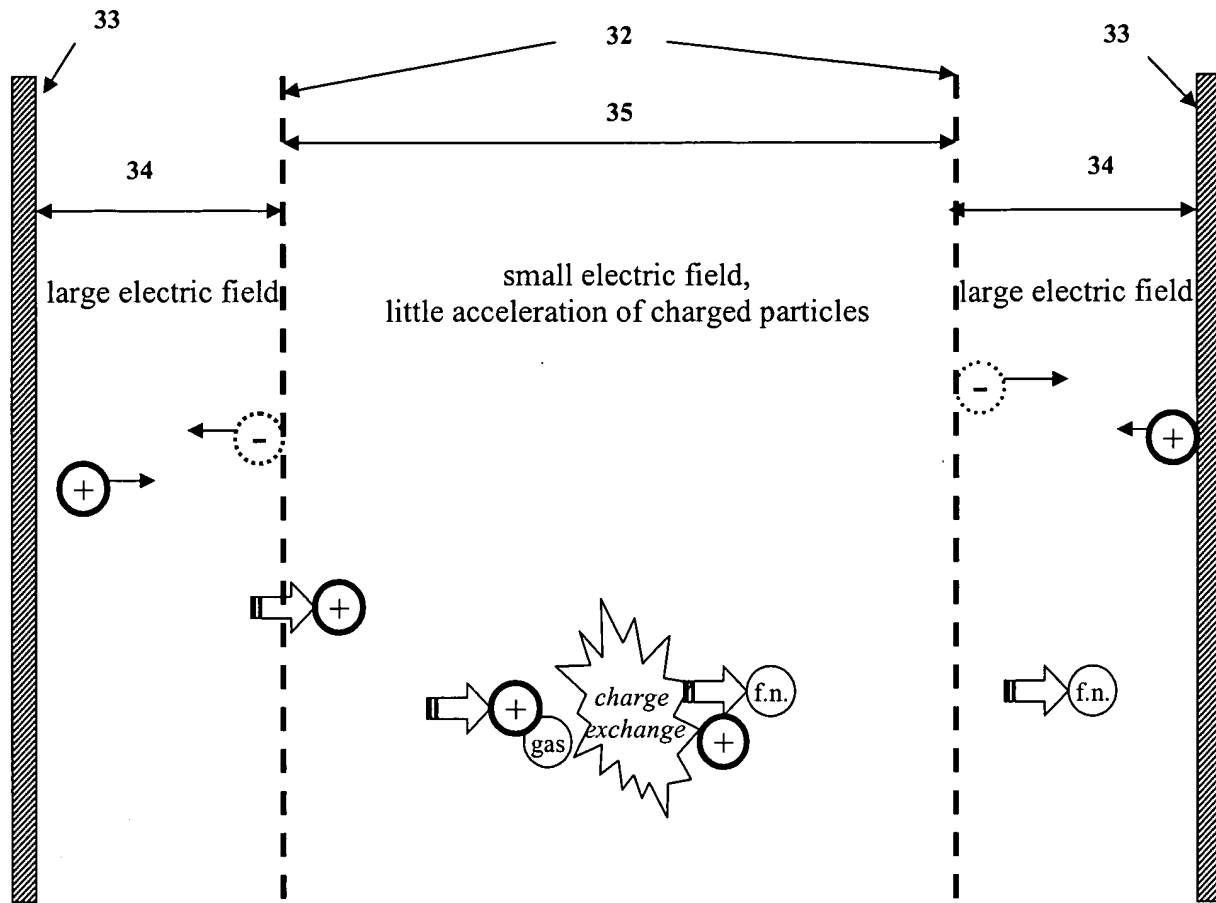


Fig. 7.

Key for Symbols Used in Figures 7, 9, and 33

electron	gaseous discharge particle has energy for collision (above thermal equilibrium)
positive ion (such as deuterium)	collision
fast neutral (such as deuterium)	neutron
background gas (such as deuterium)	helium-3

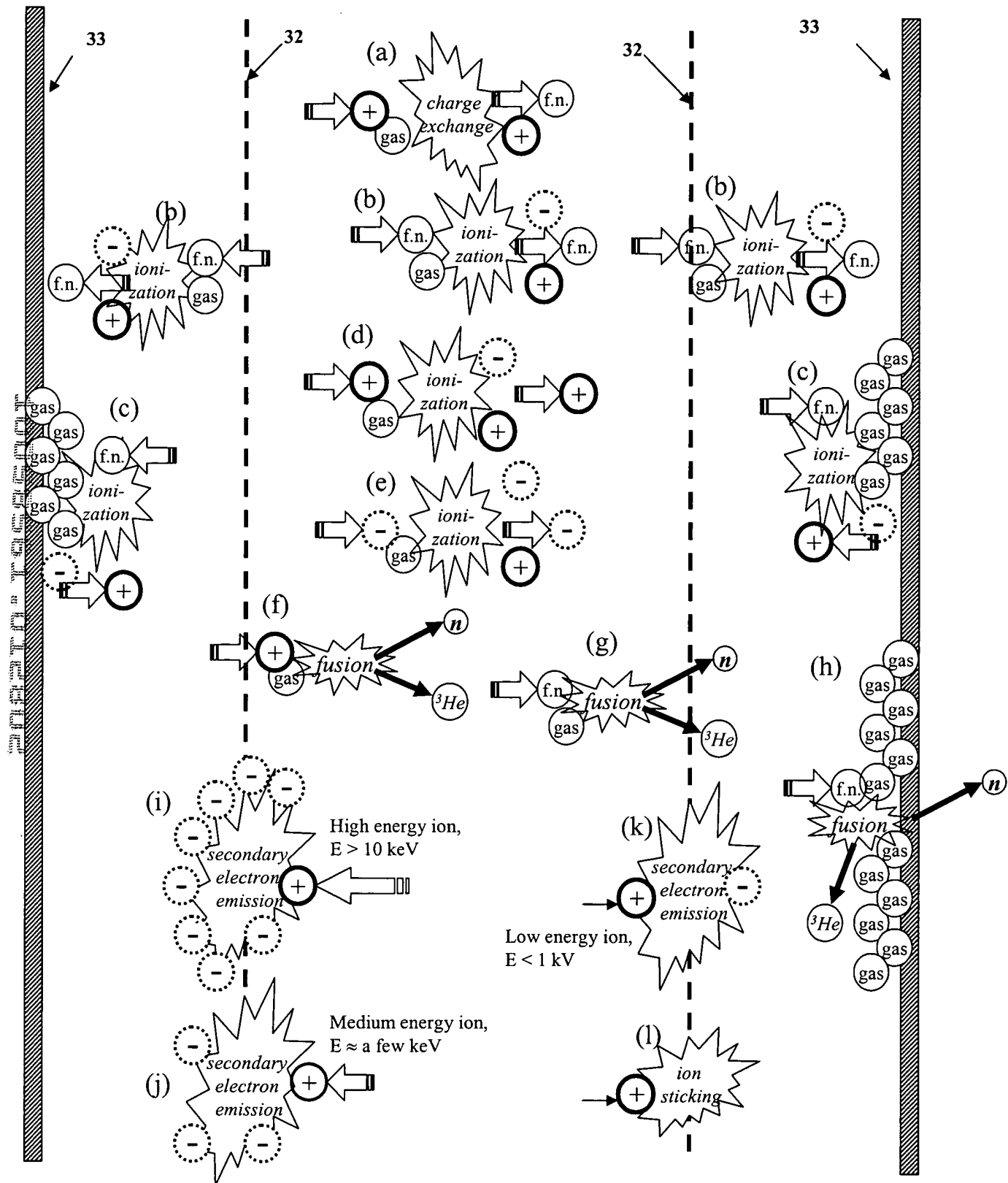


Fig. 9.

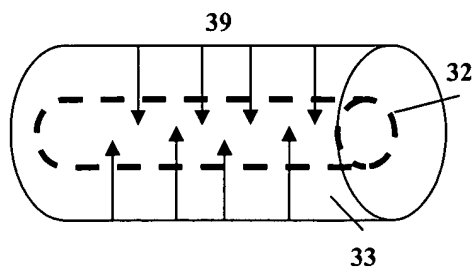


Fig. 10a.

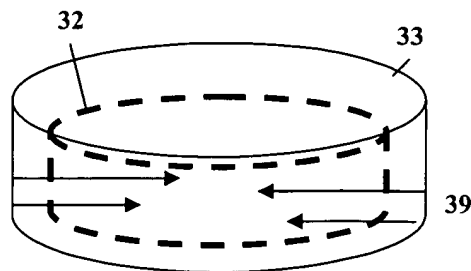


Fig. 10b.

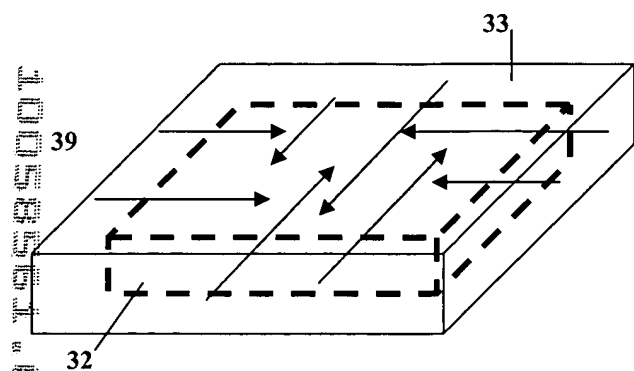


Fig. 10c.

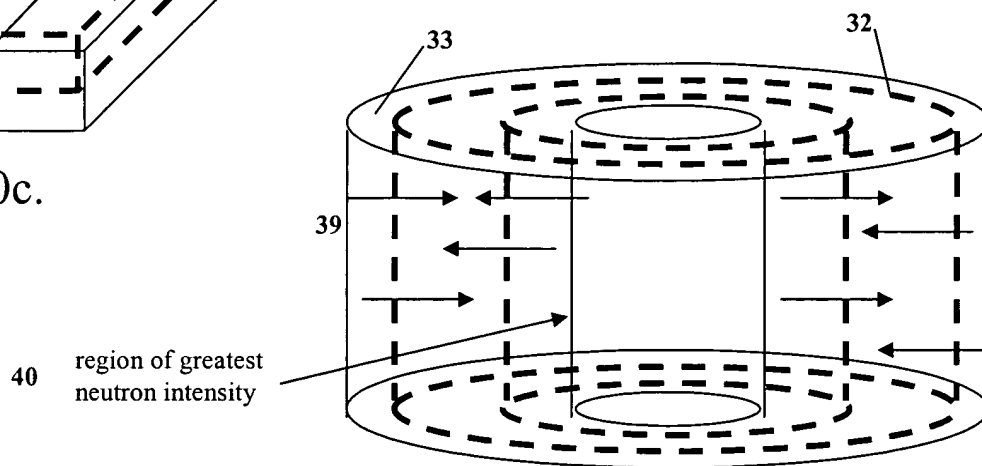


Fig. 10d.

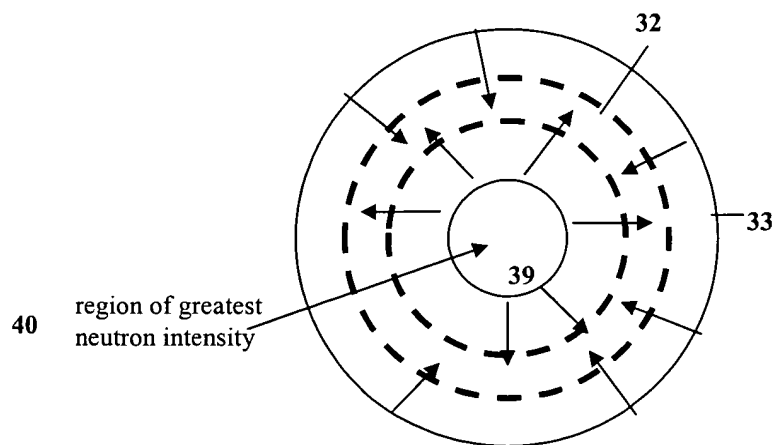


Fig. 10e.

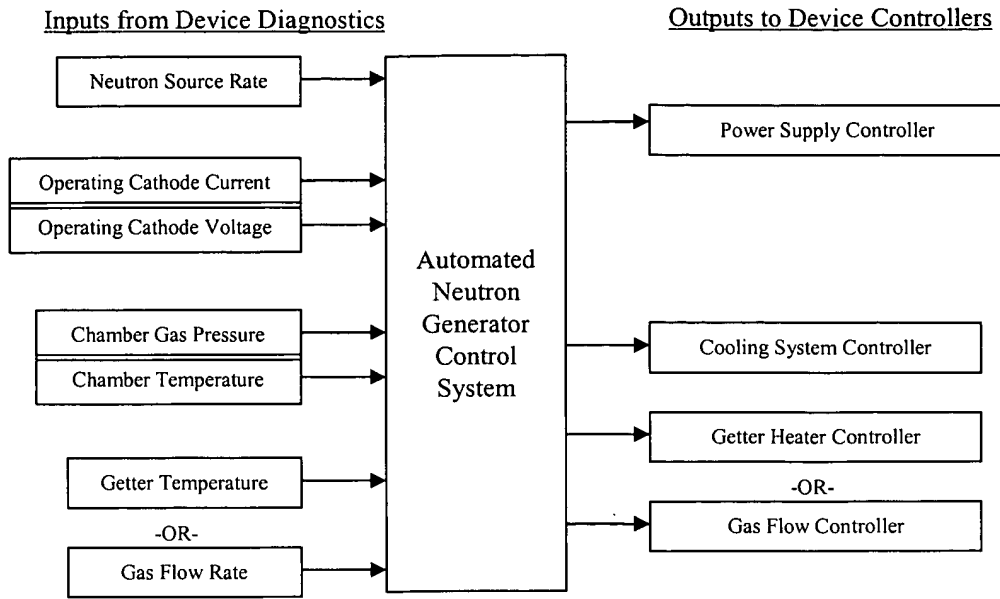


Fig. 11.

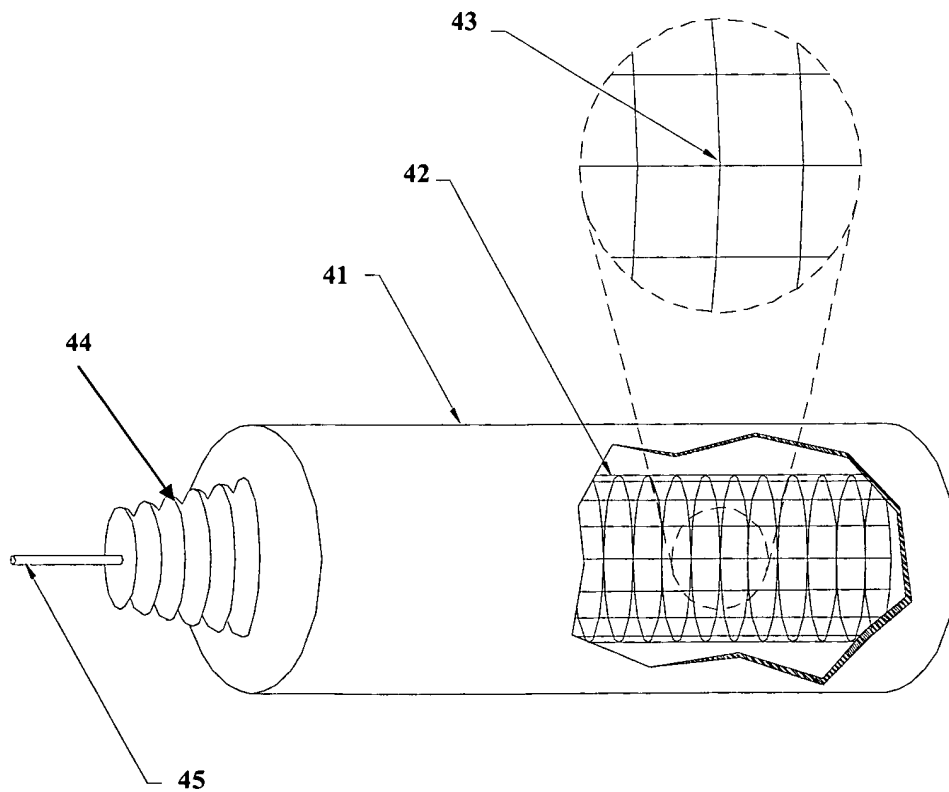


Fig. 12.

2023-07-19 10:55:51

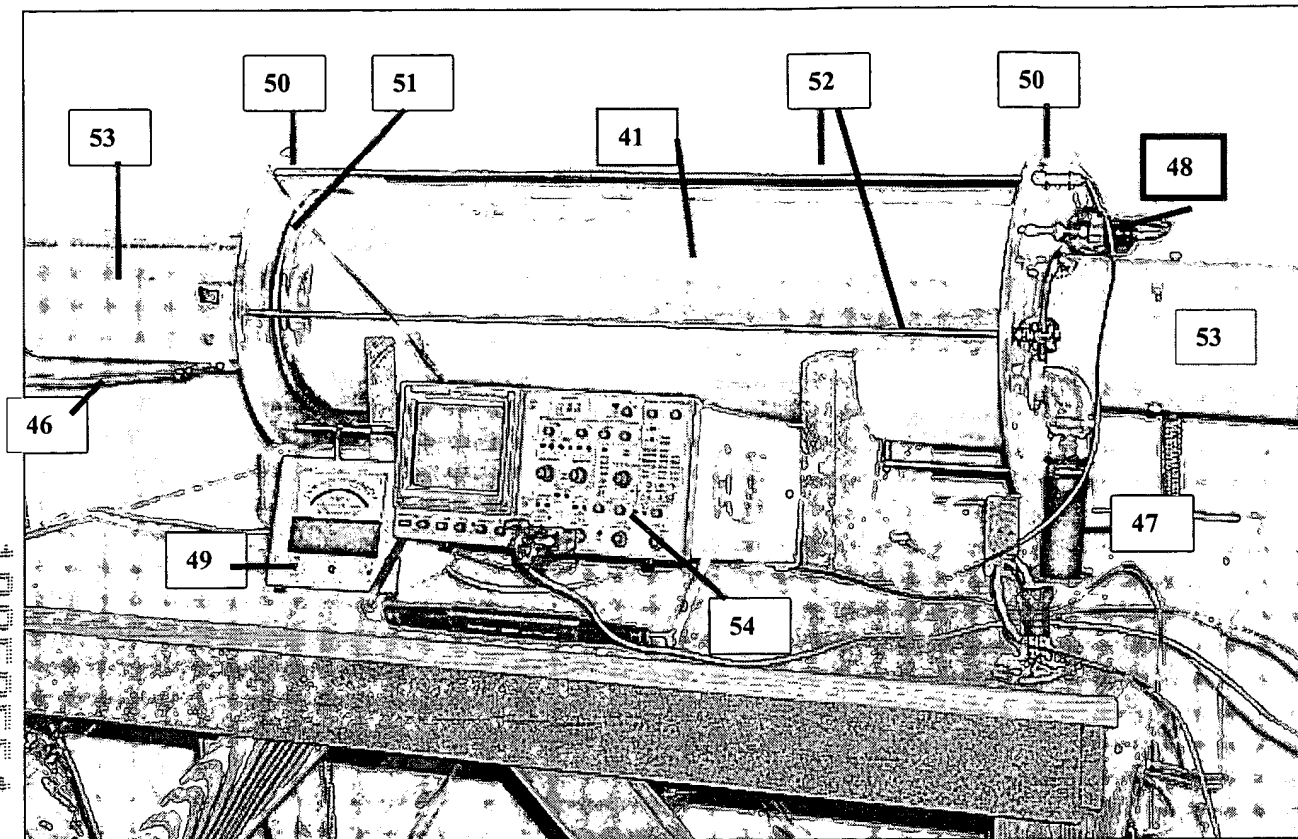


Fig. 13.

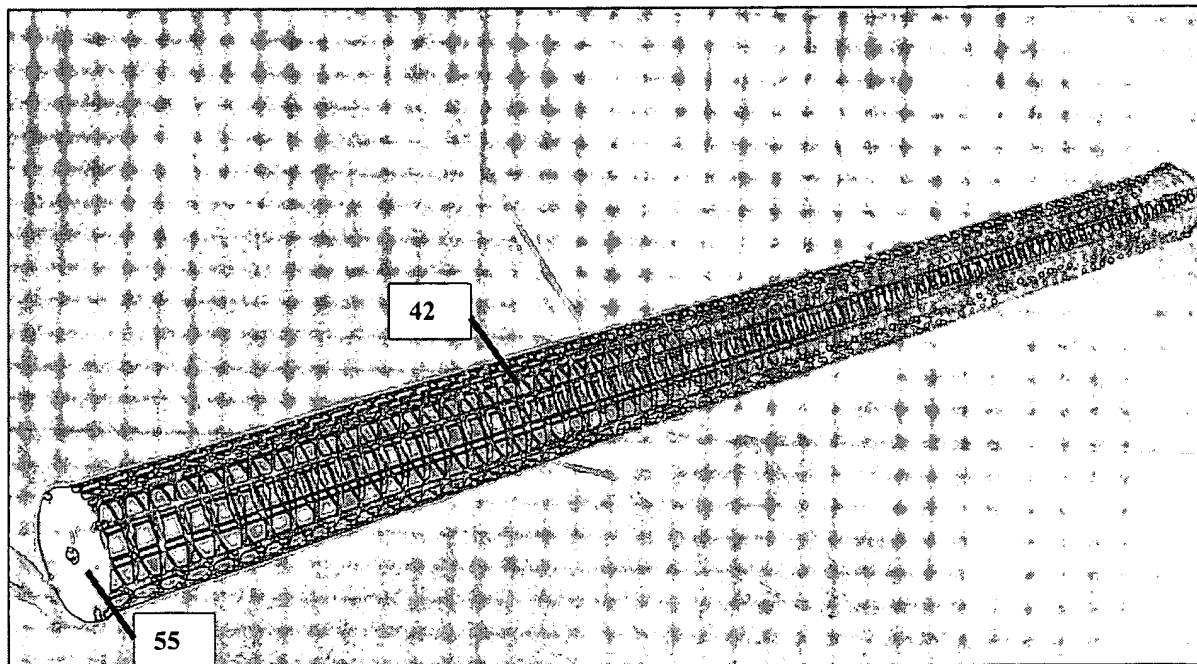


Fig. 14.

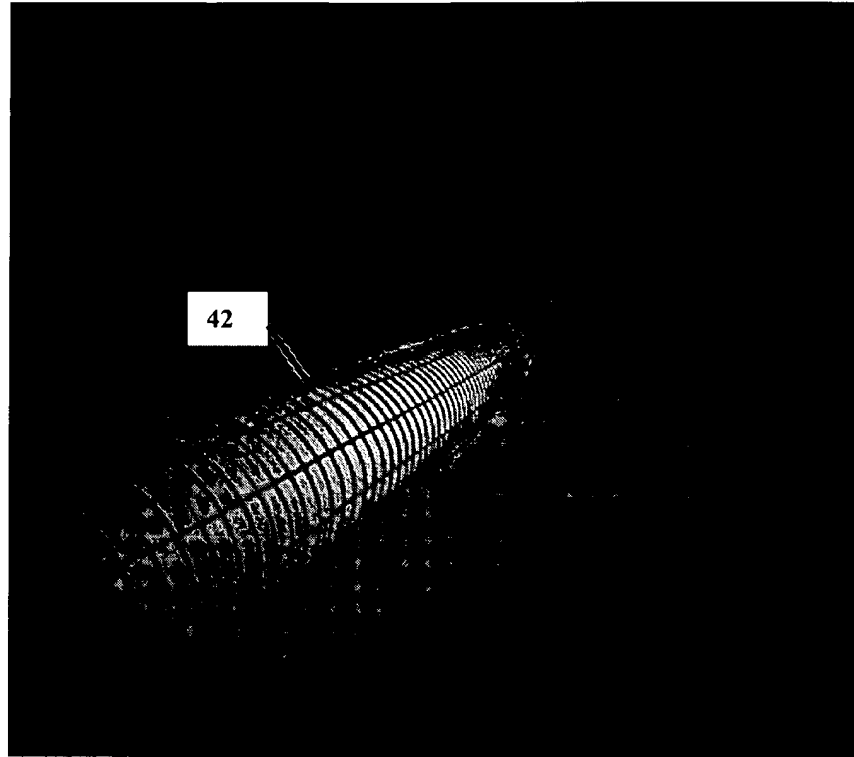


Fig. 15.

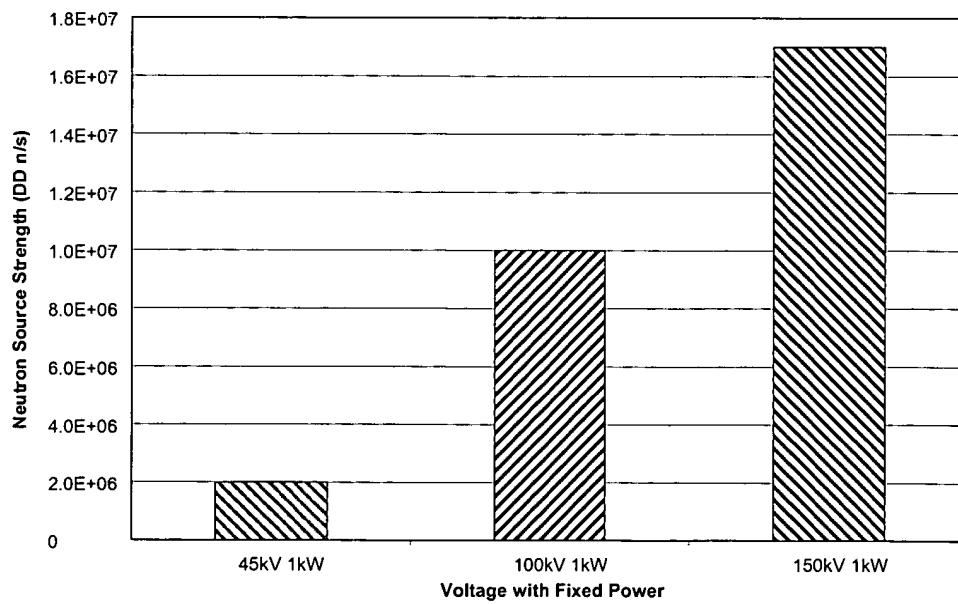


Fig. 16.

10058561.012800
208270" T958500T

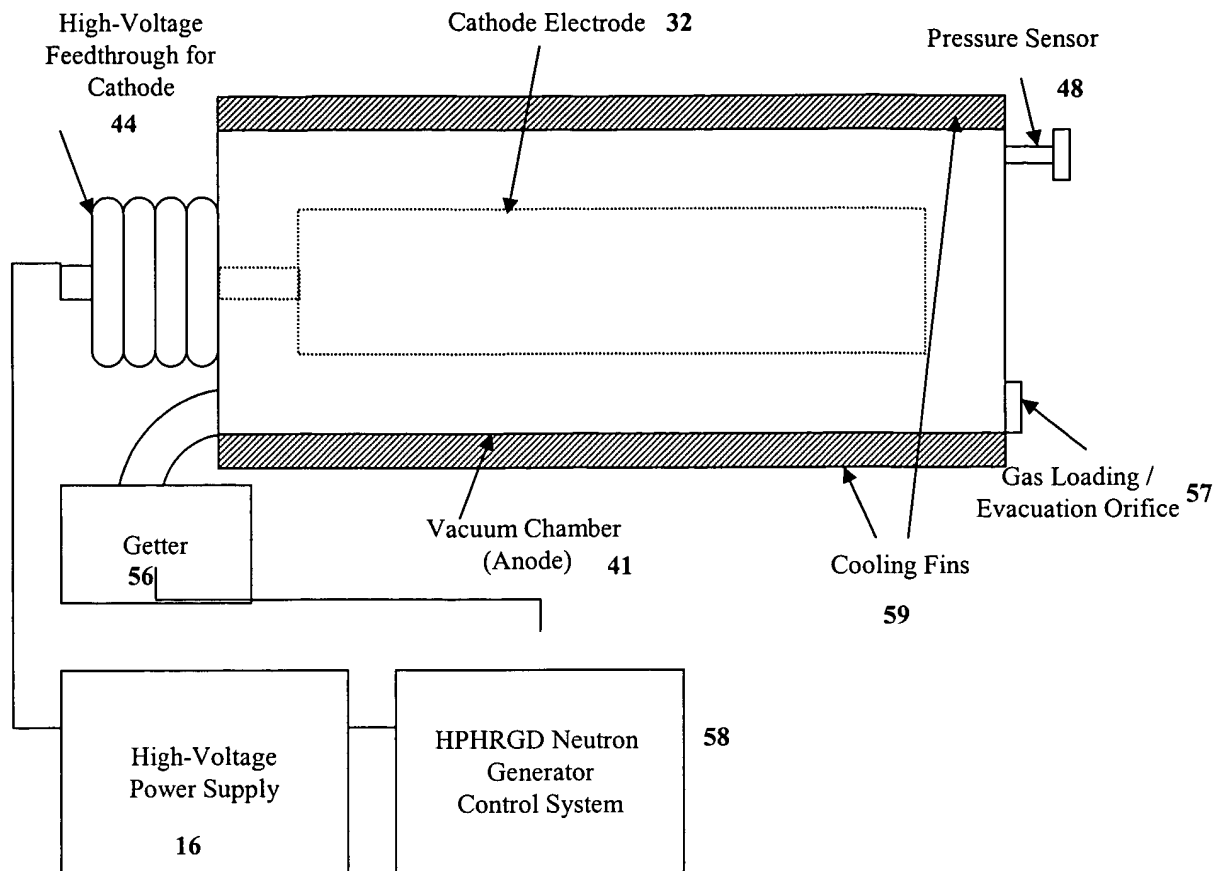


Fig. 17.

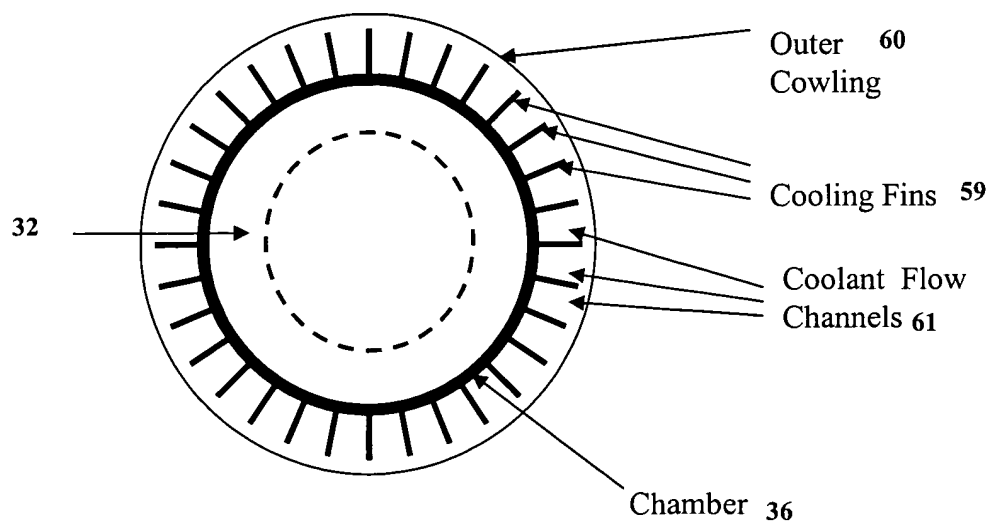


Fig. 18.

2025-10-10 10:10:10

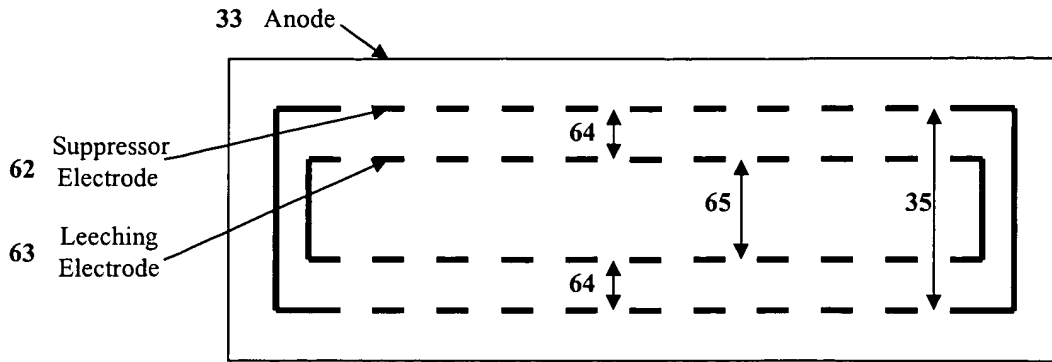


Fig. 19.

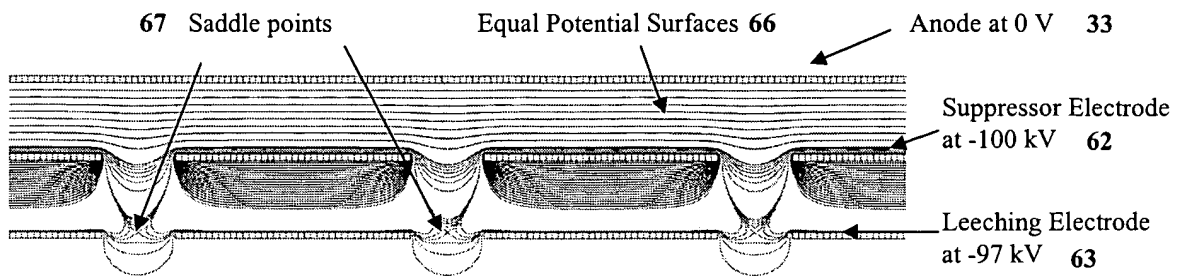


Fig. 20.

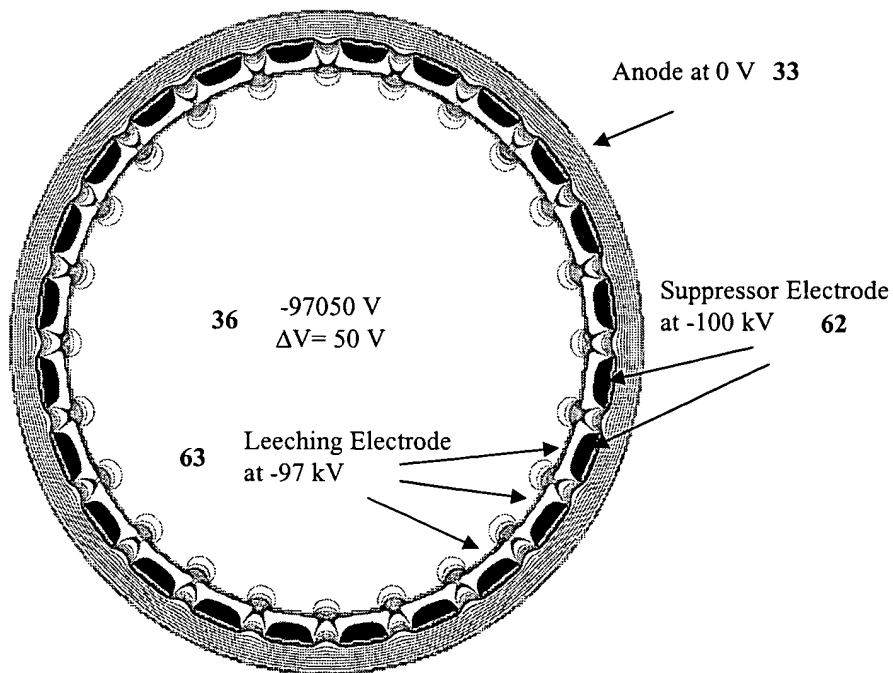


Fig. 21.

208270 " 012800

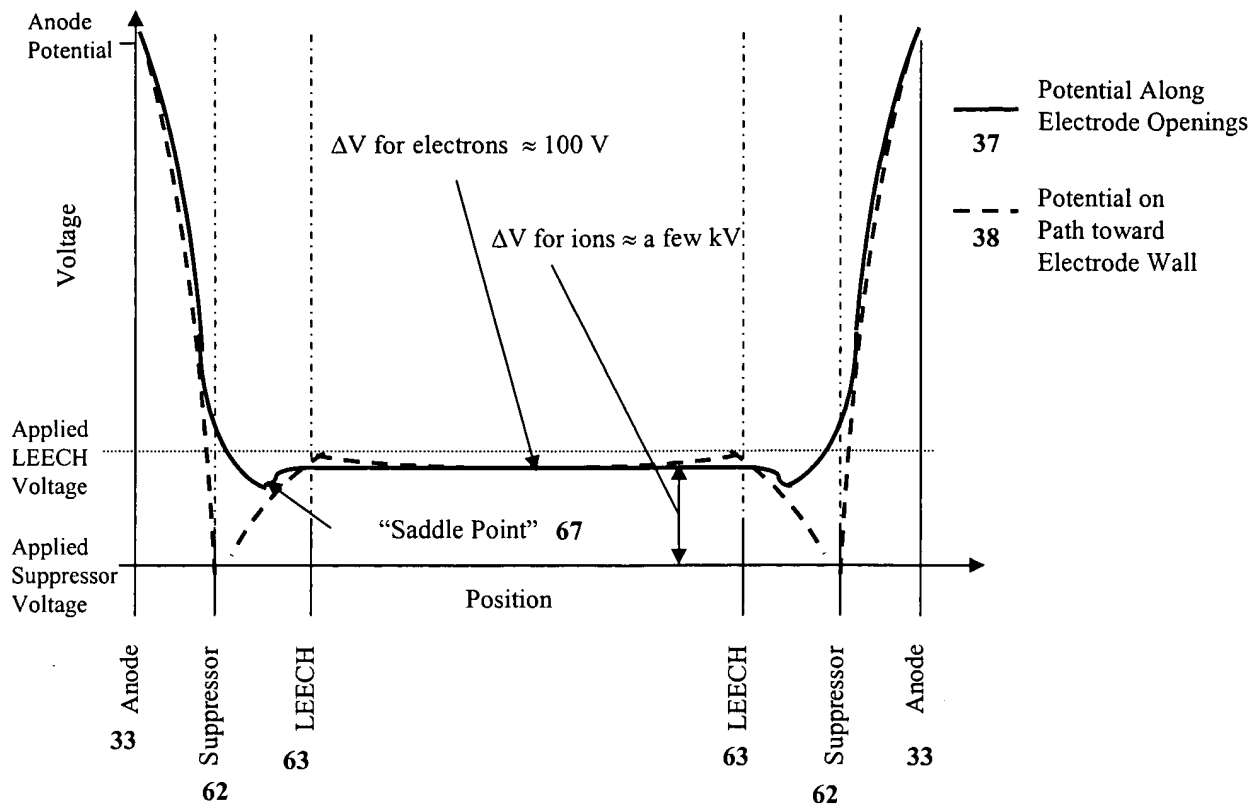


Fig. 22.

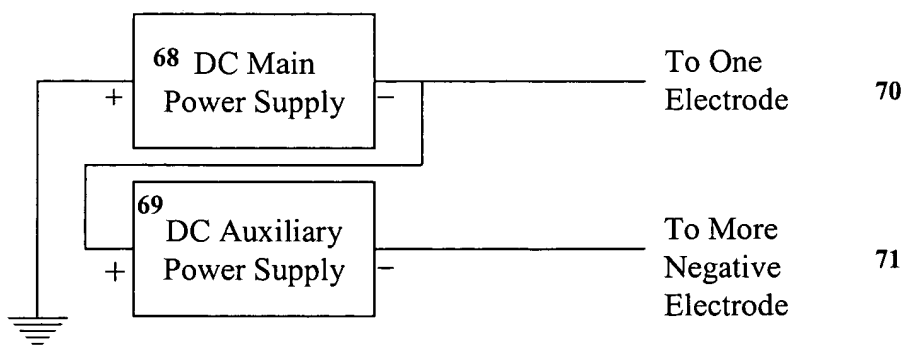


Fig. 23(a).

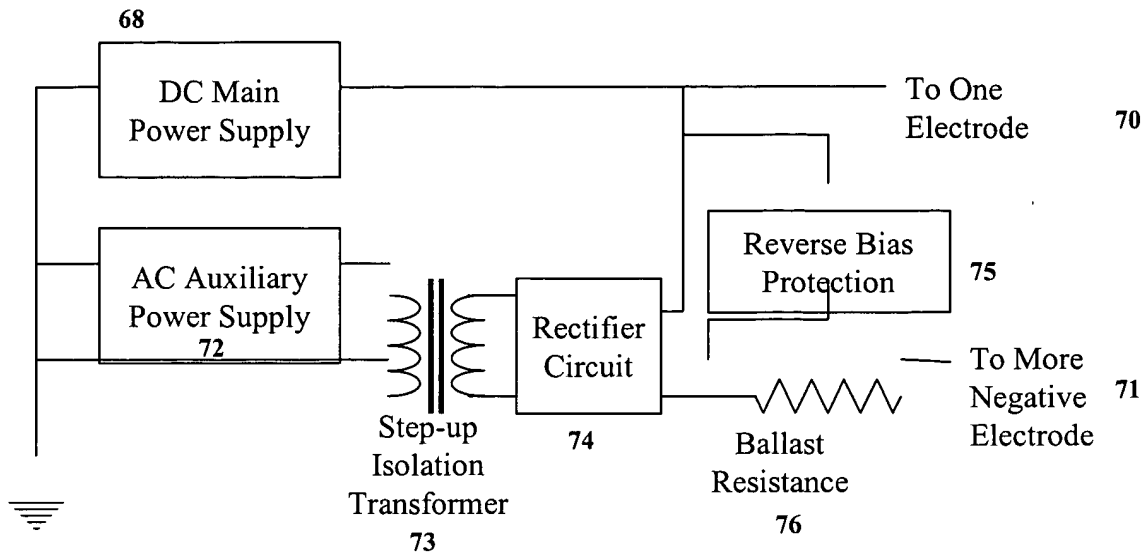


Fig. 24.

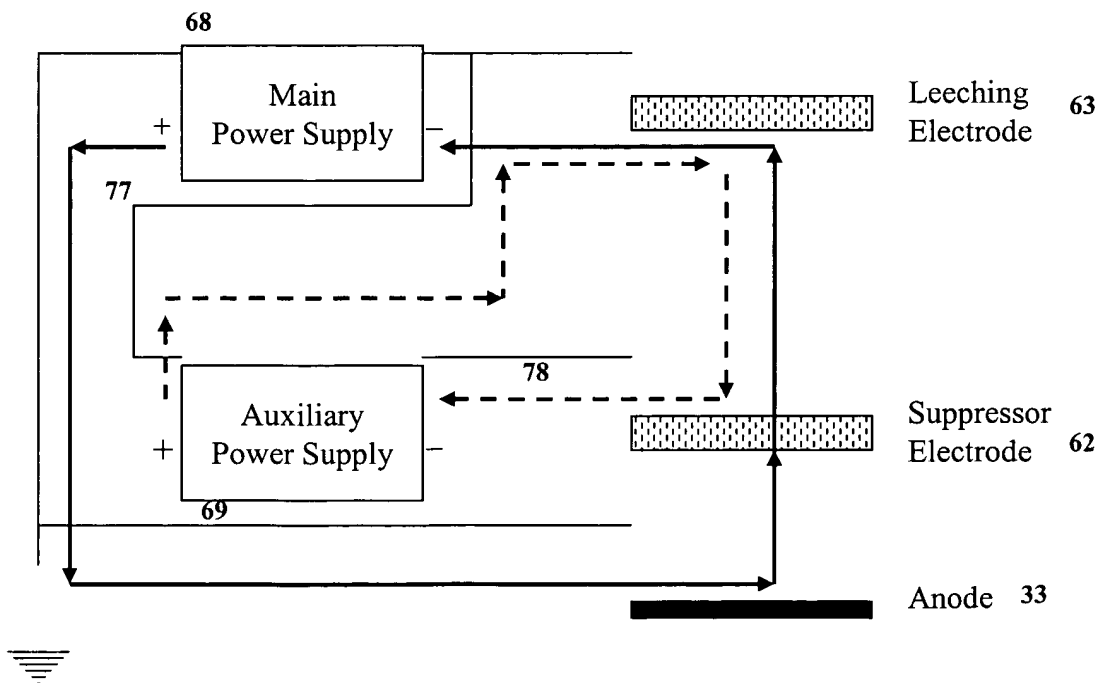


Fig. 25.

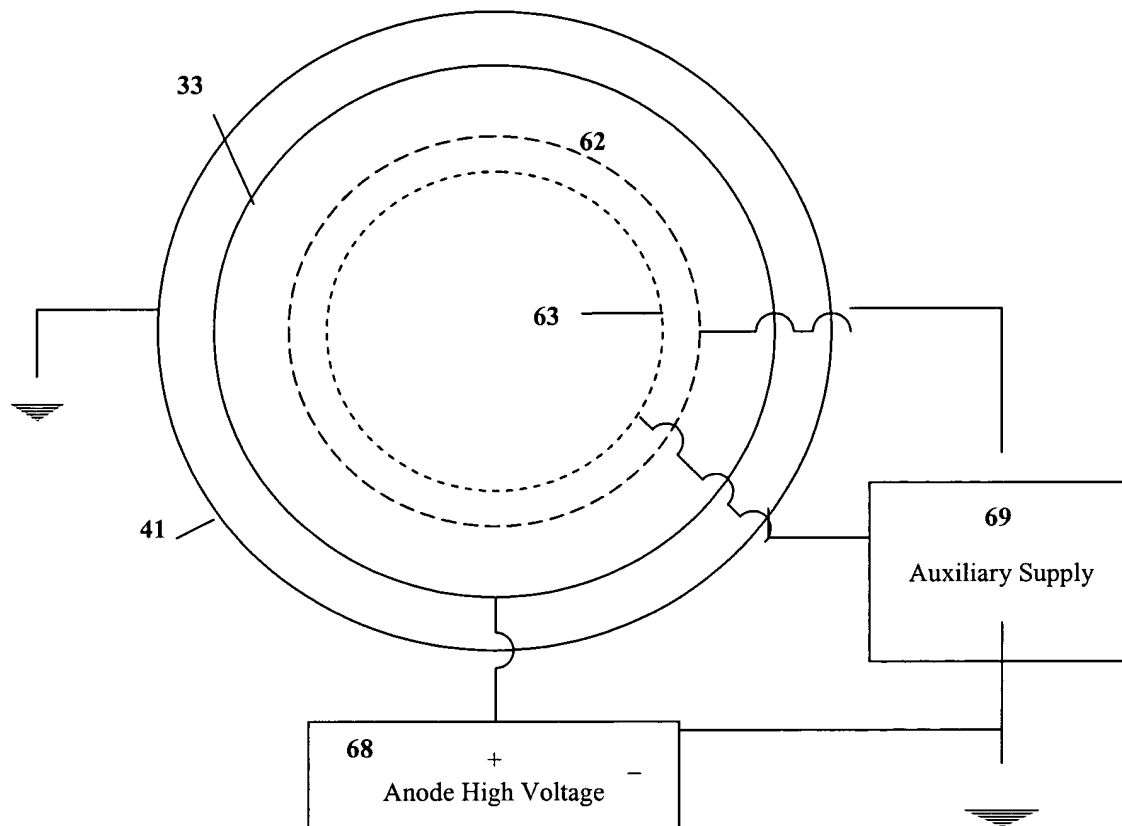


Fig. 26.

10058551.012802

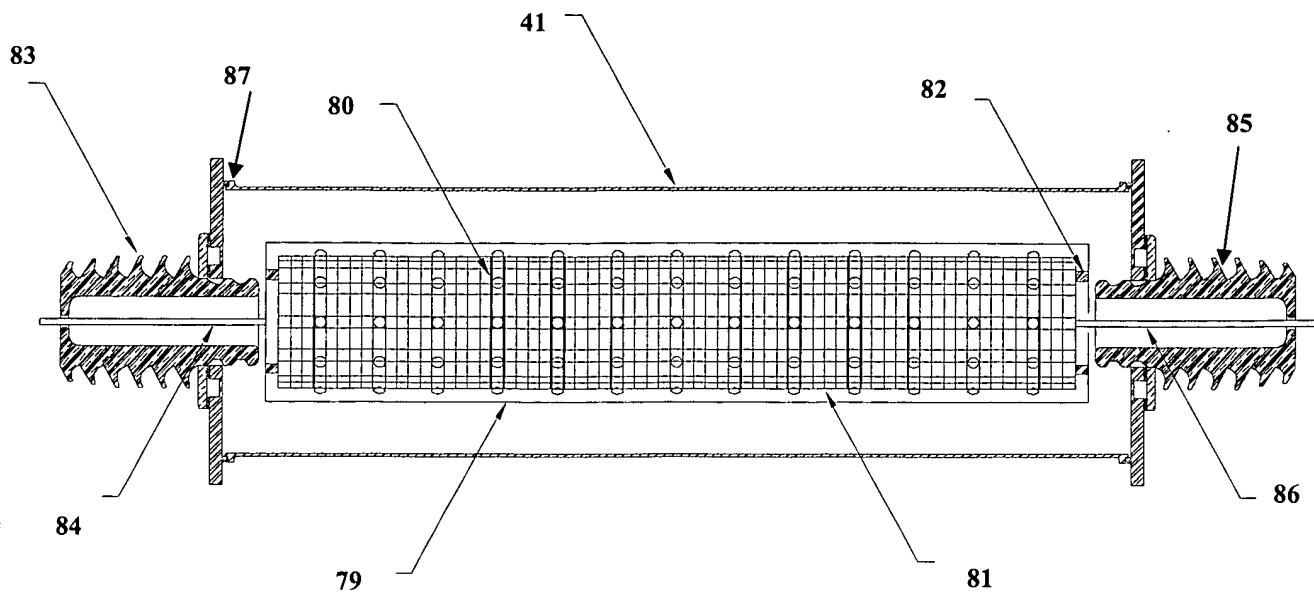


Fig. 27a.

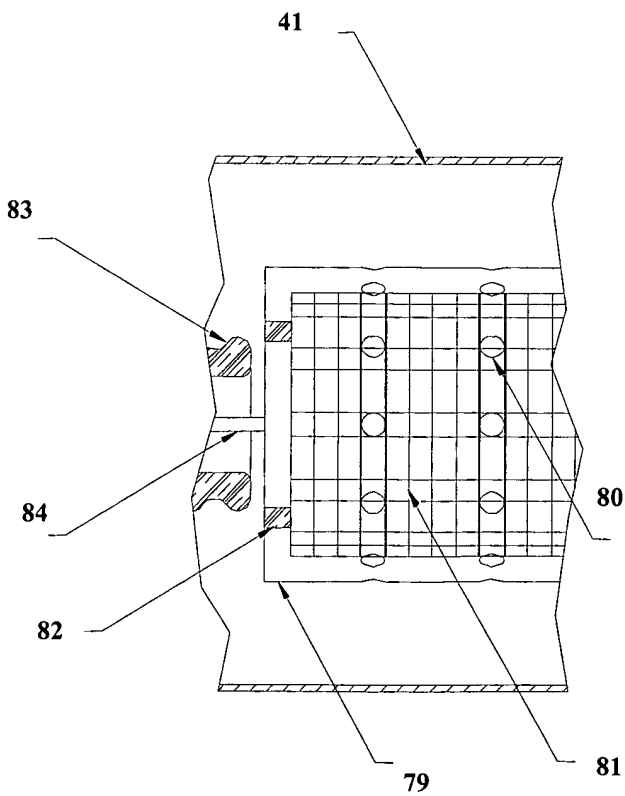


Fig. 27b.

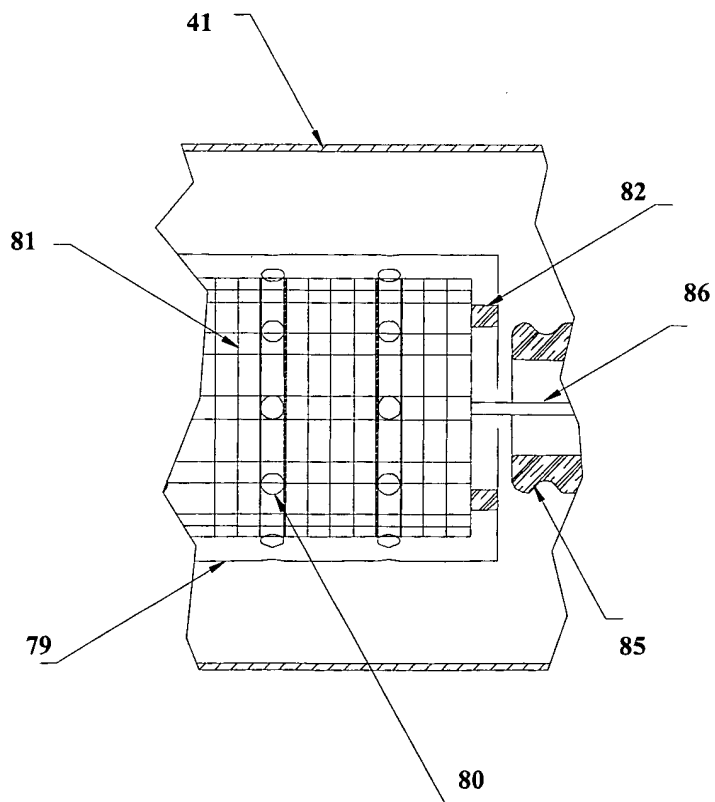


Fig. 27c.

2025-10-12 10:55:10

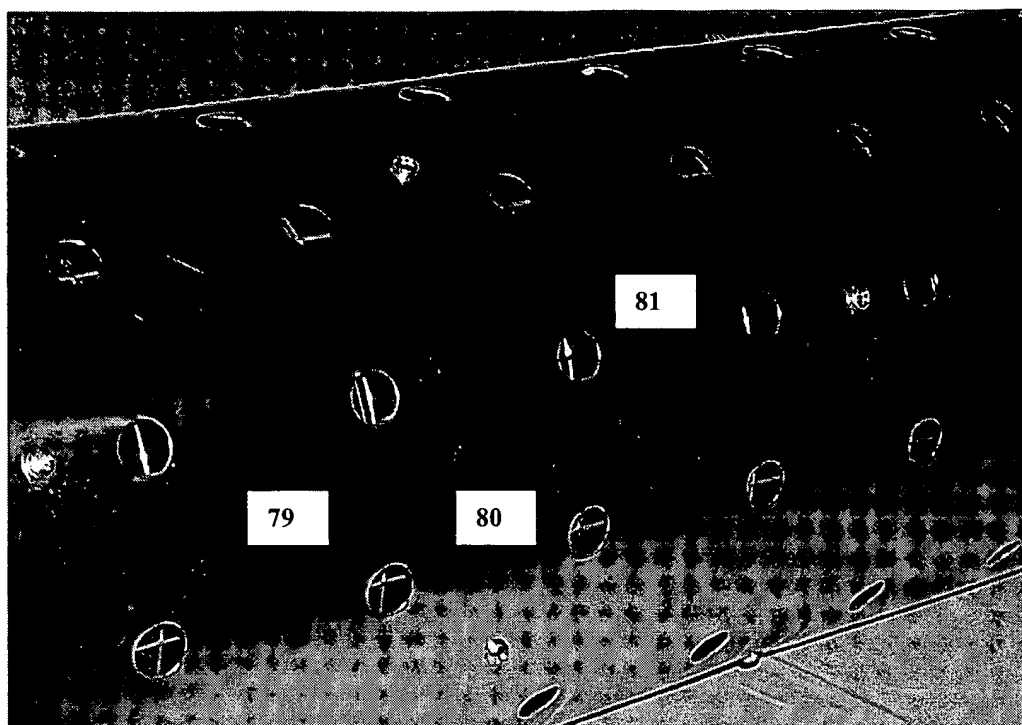


Fig. 28.



Fig. 29.

10058561.012800

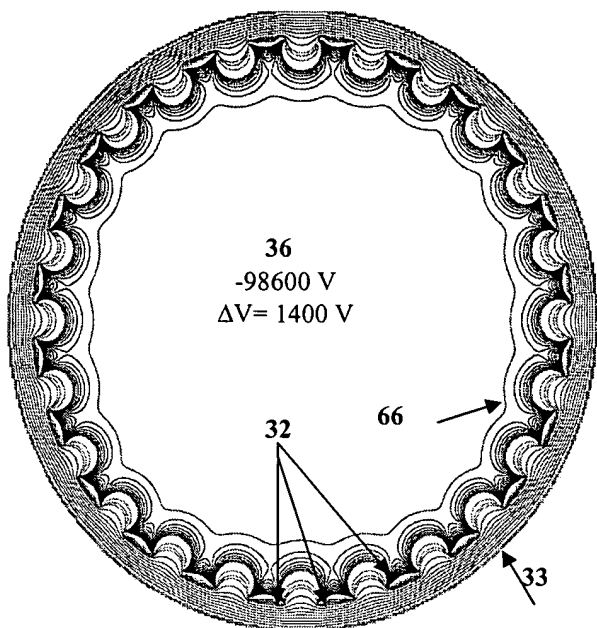


Figure 30a.

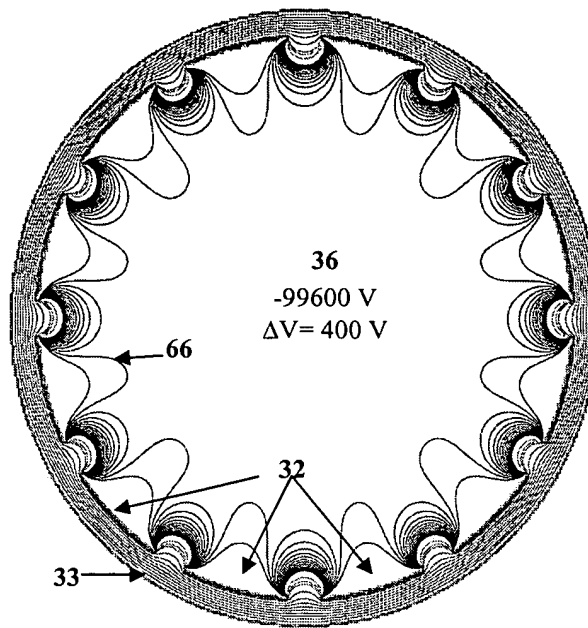


Figure 30b.

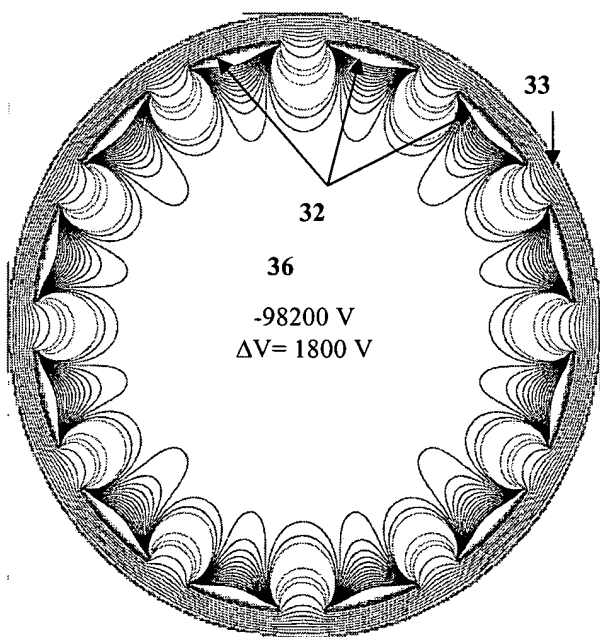


Figure 30c.

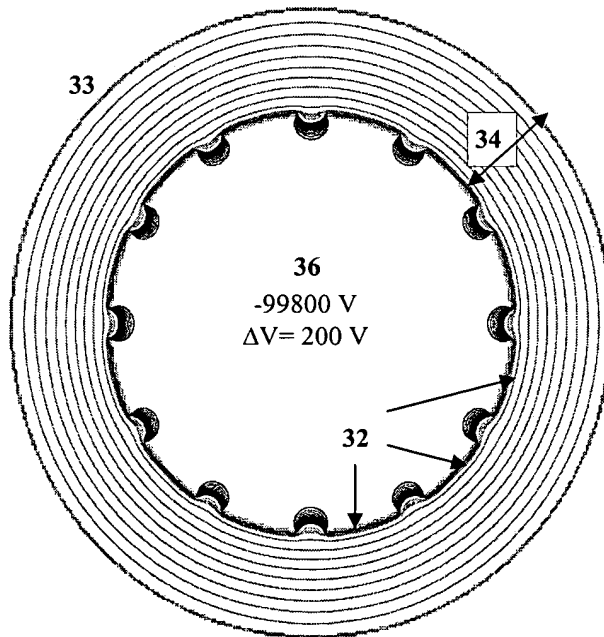


Figure 30d.

10058561 012802

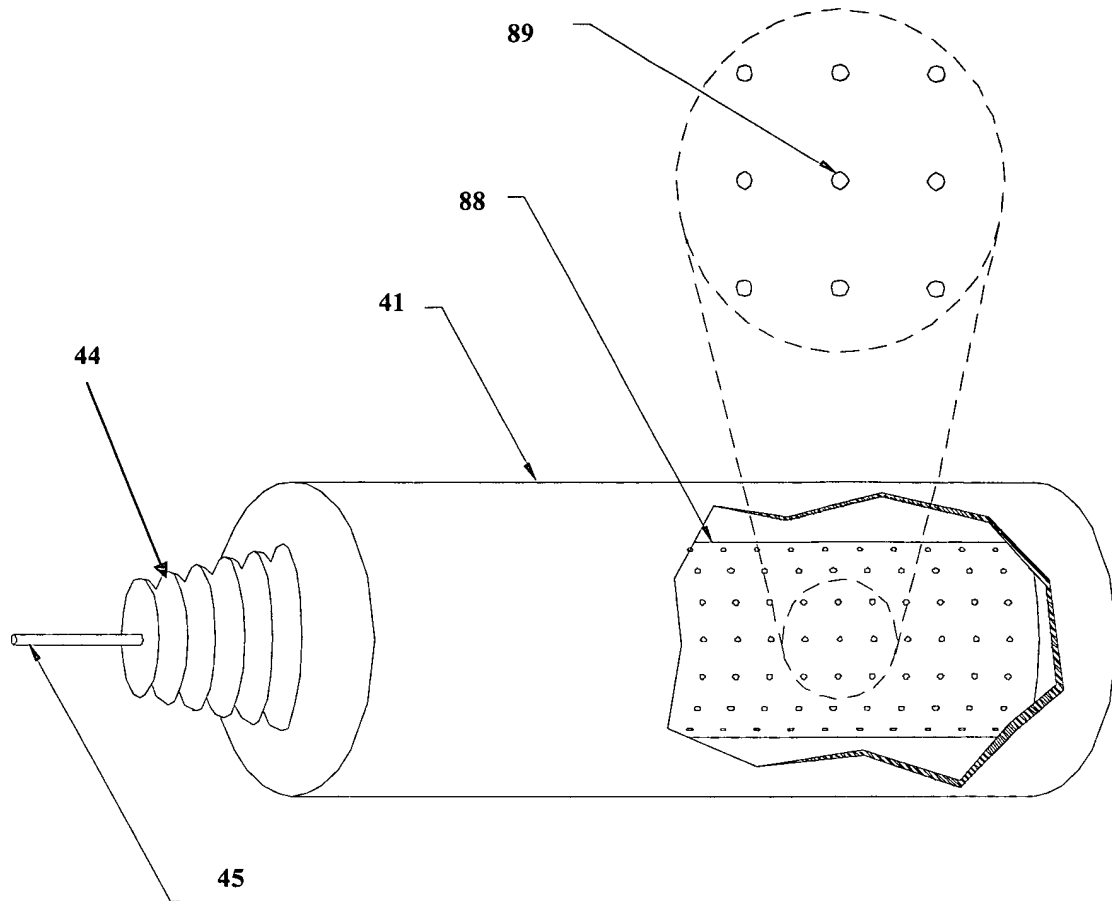


Figure 31.

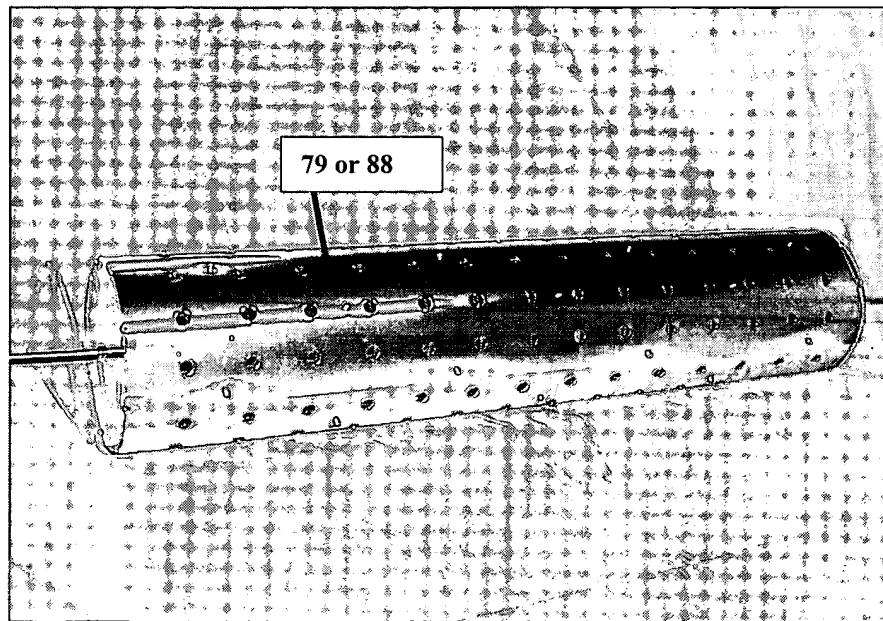


Figure 32.

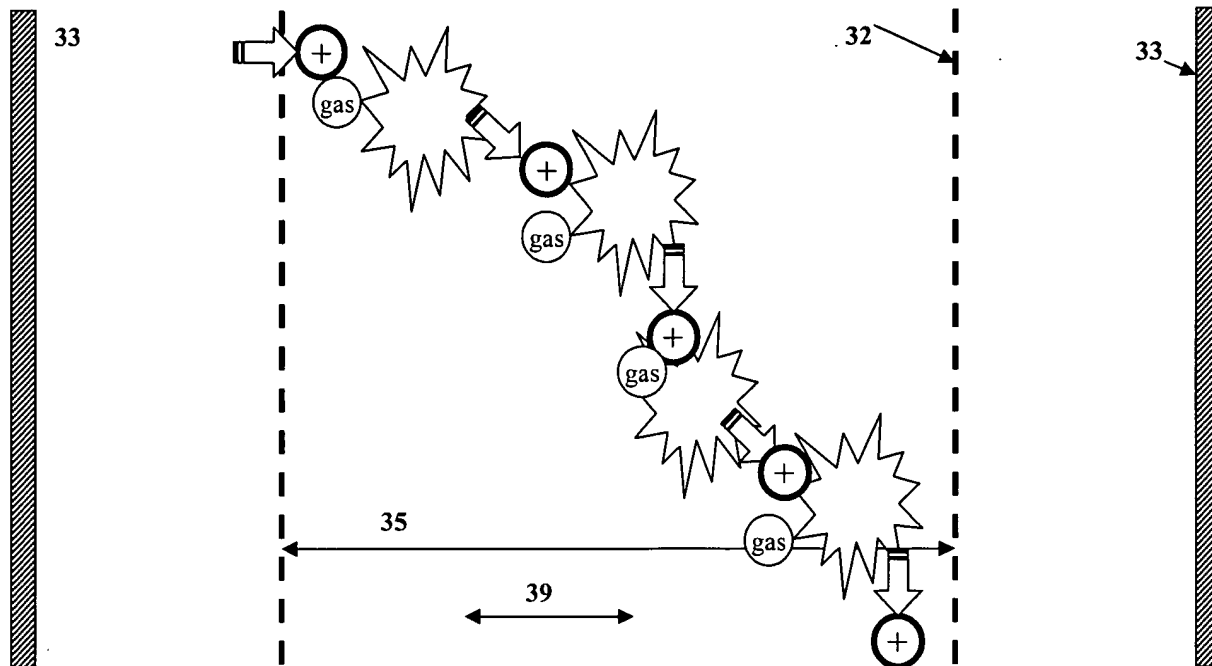


Figure 33a.

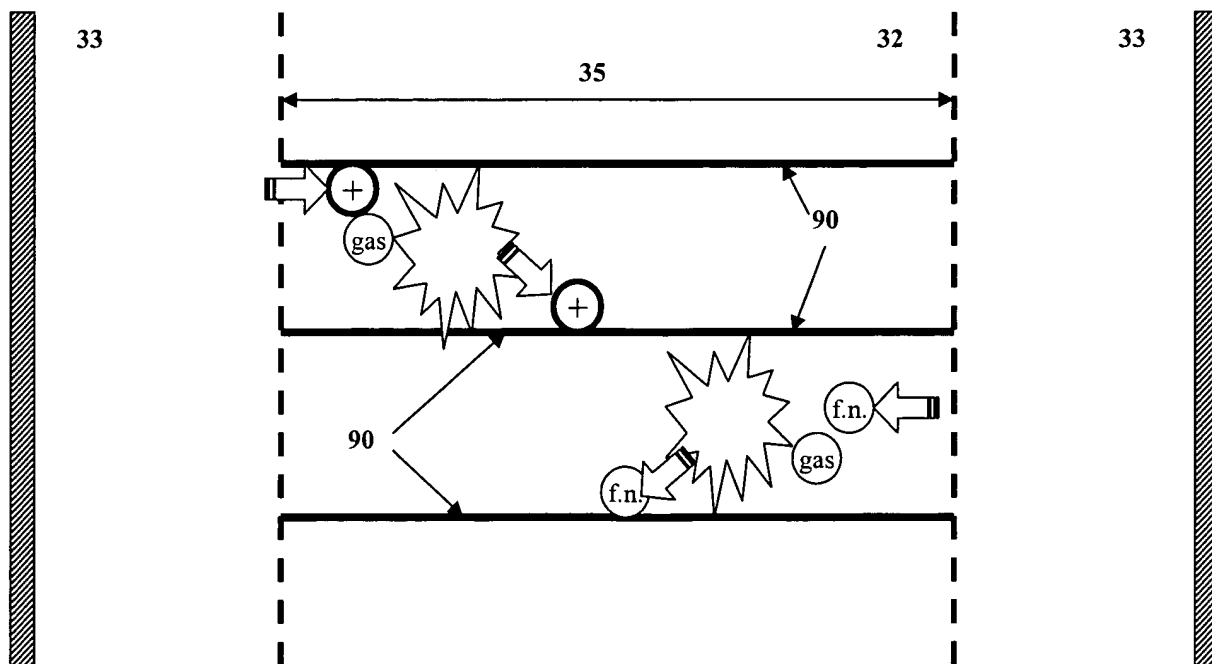


Figure 33b.

10058561.012802

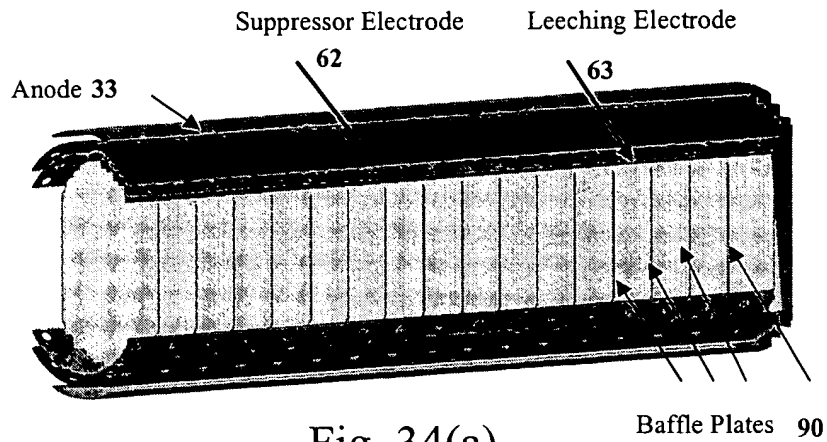


Fig. 34(a).

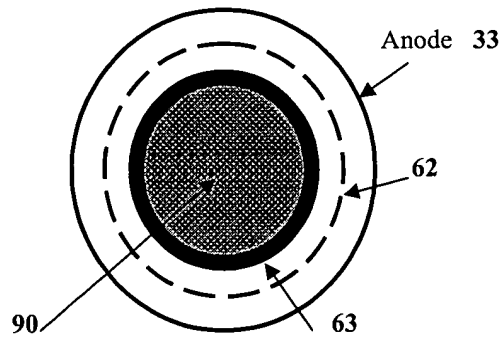


Fig. 34(b).

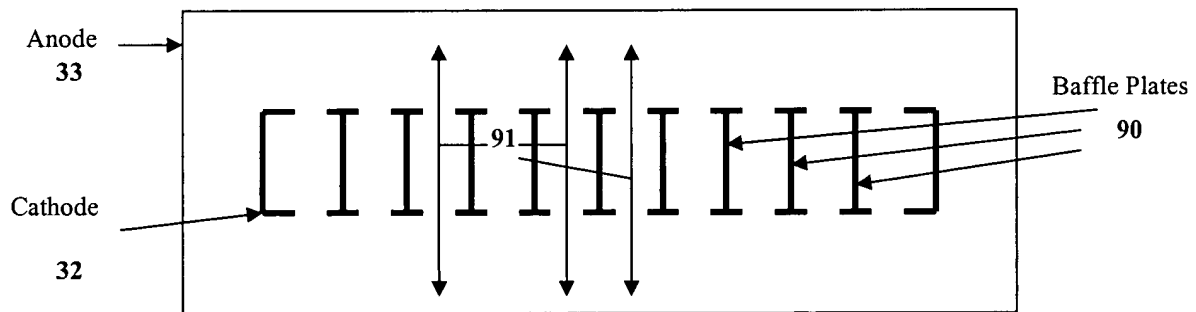


Fig. 35(a).

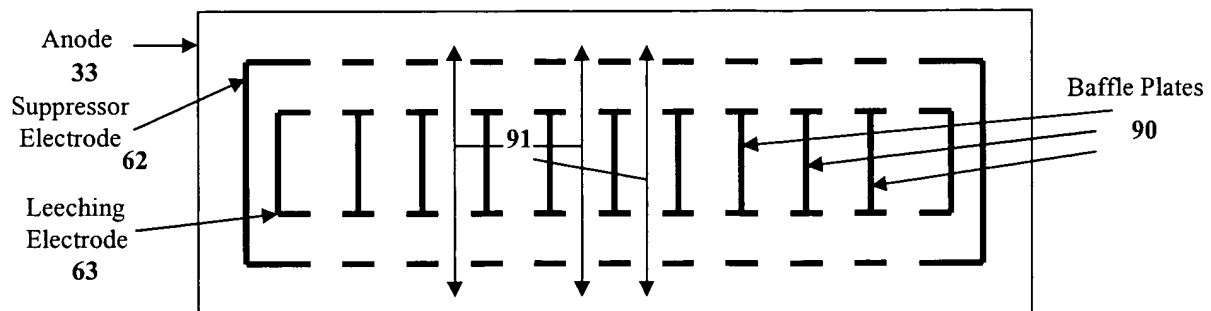


Fig. 35(b).

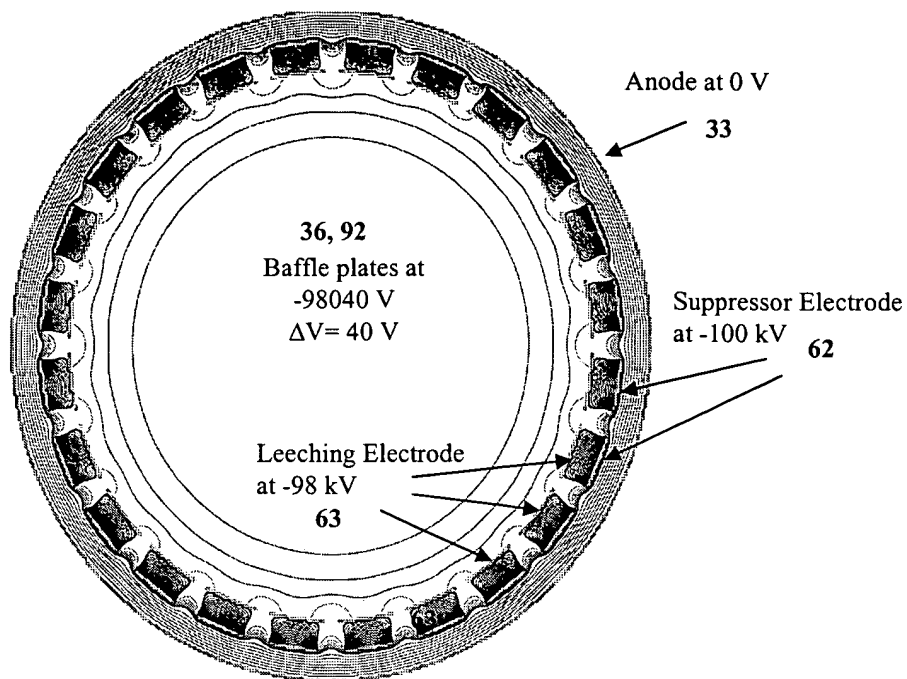


Figure 36.

208270" T958500T

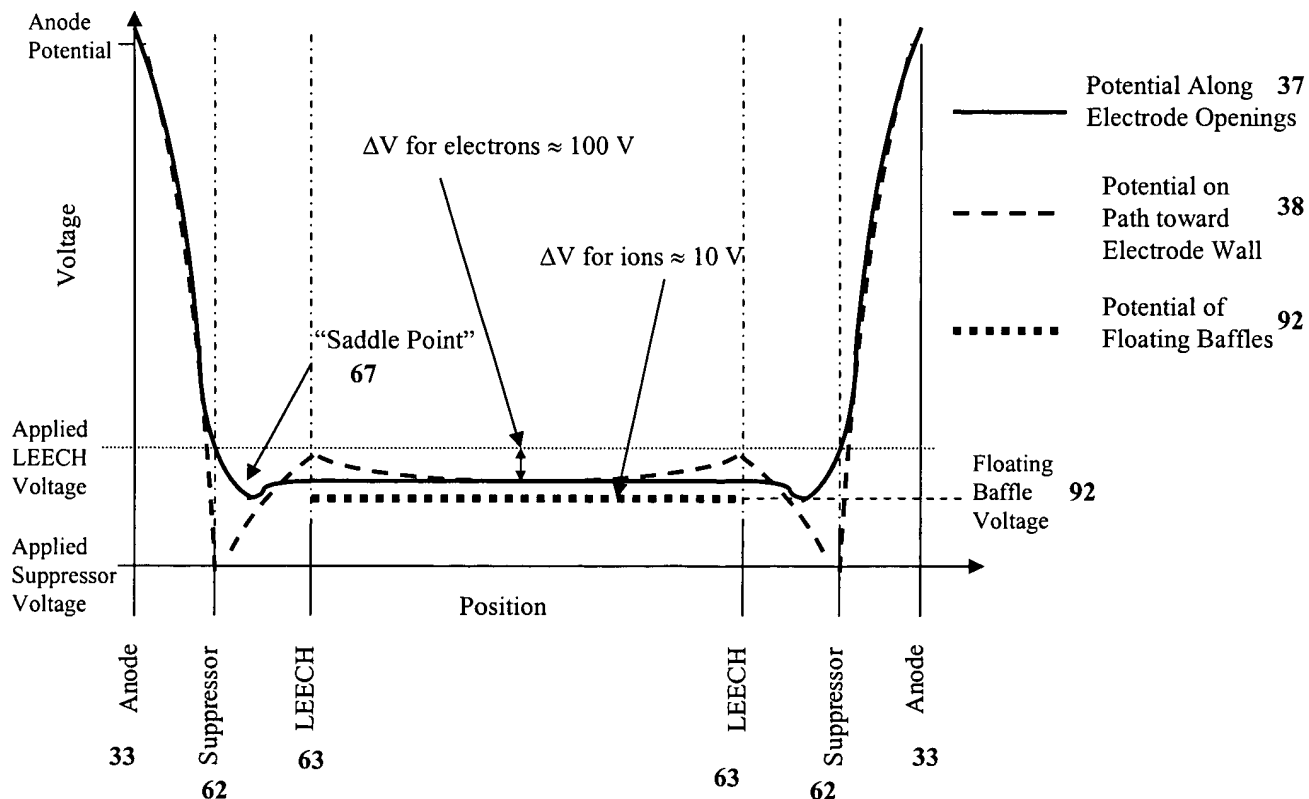


Fig. 37.

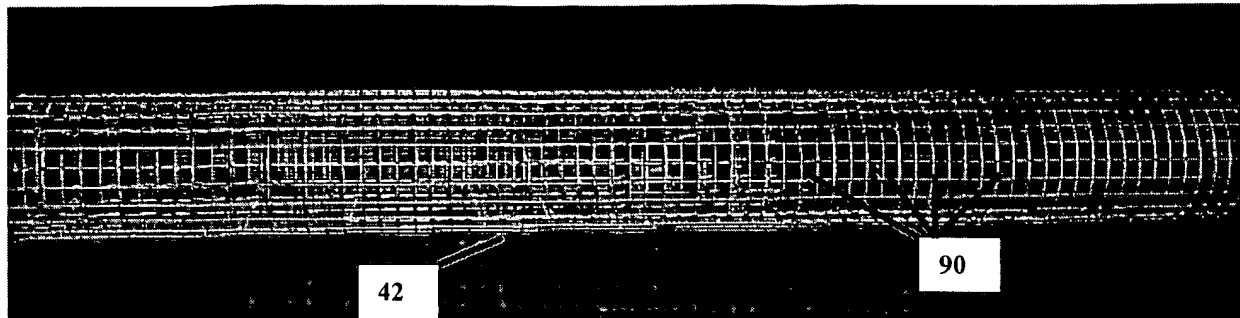


Fig. 38.

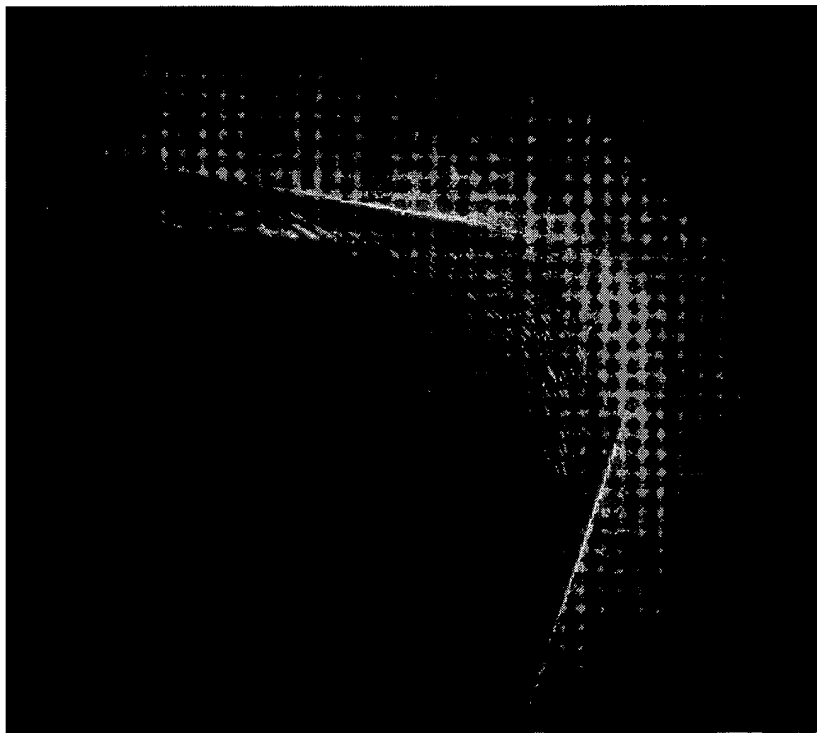


Fig. 39.

10058551.012802
20221019585001

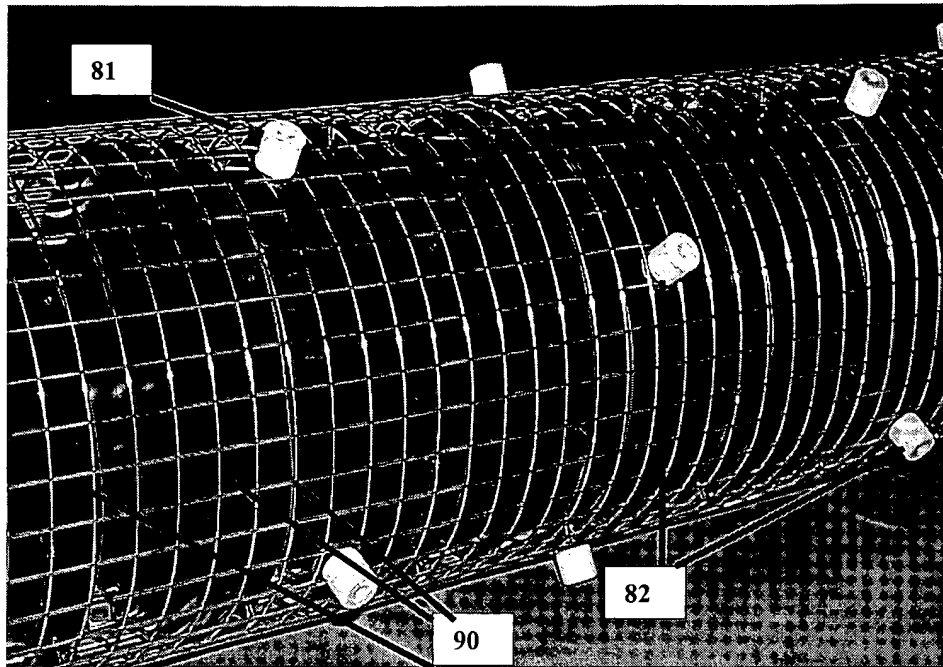
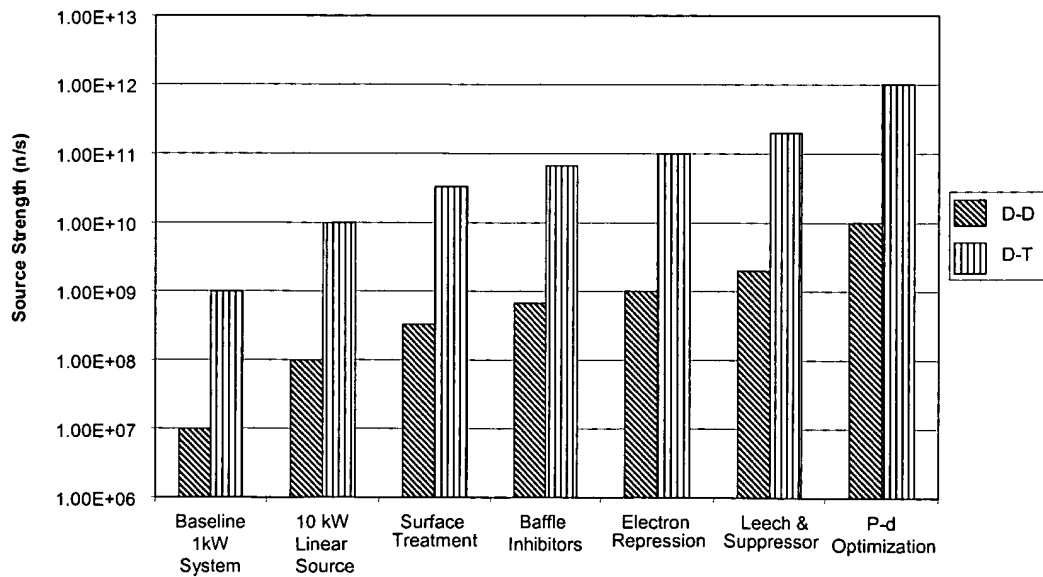


Fig. 40.



Technical Innovations

Fig. 41.

2022-10-10 10:58:51

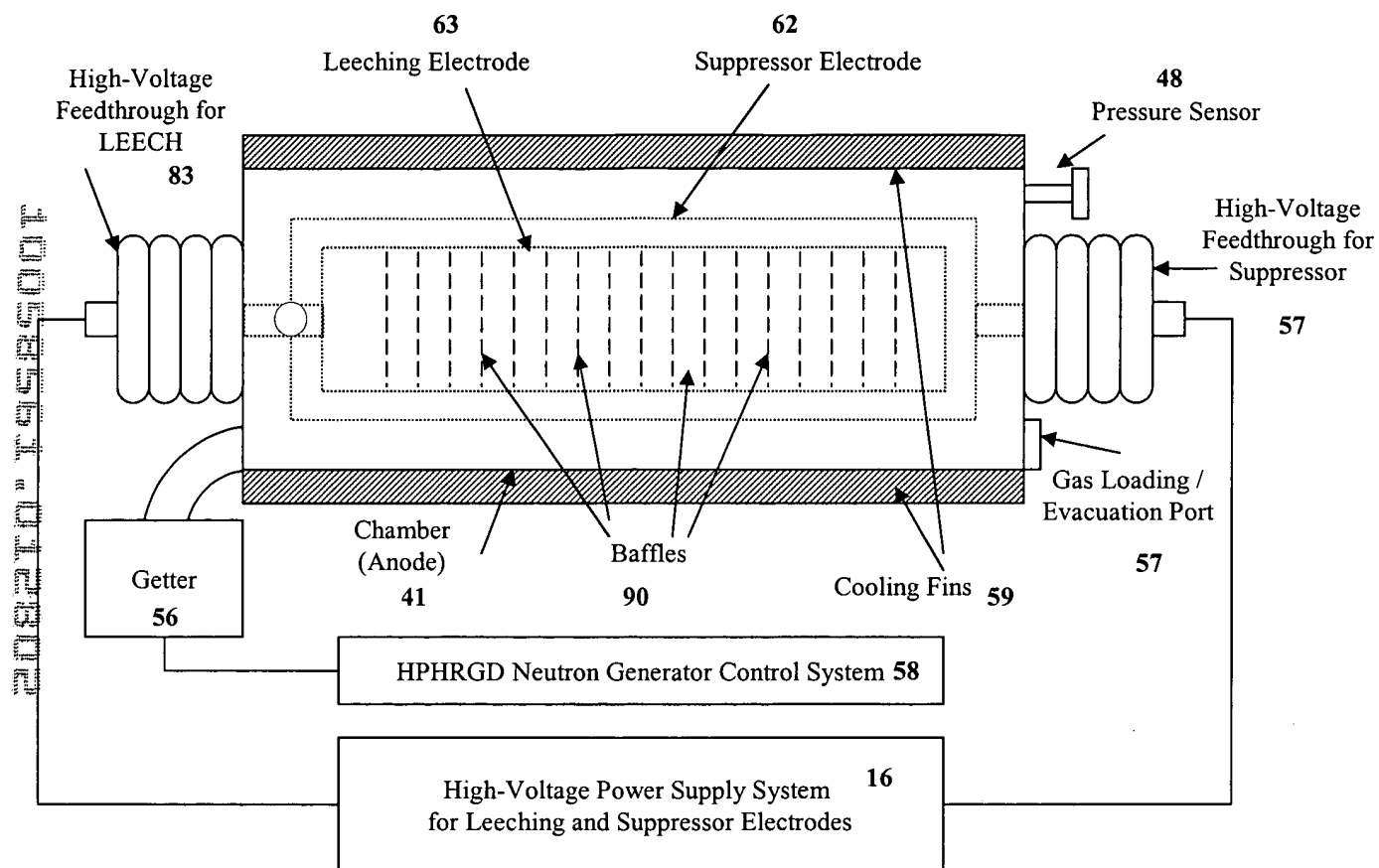


Fig. 42.

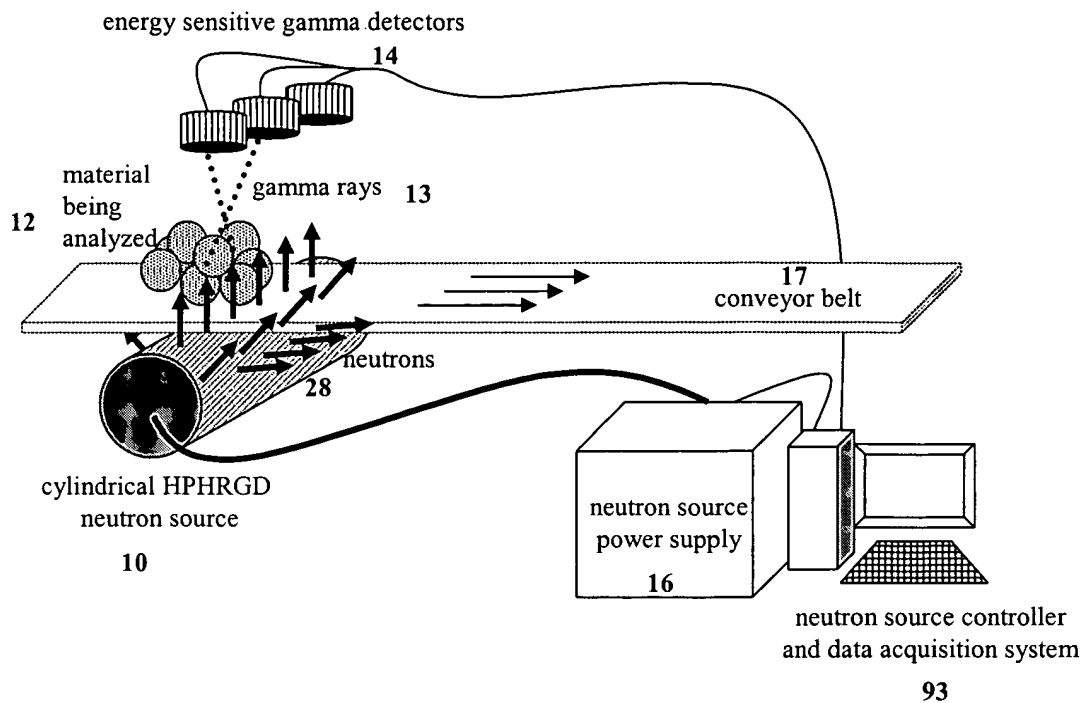


Fig. 43.

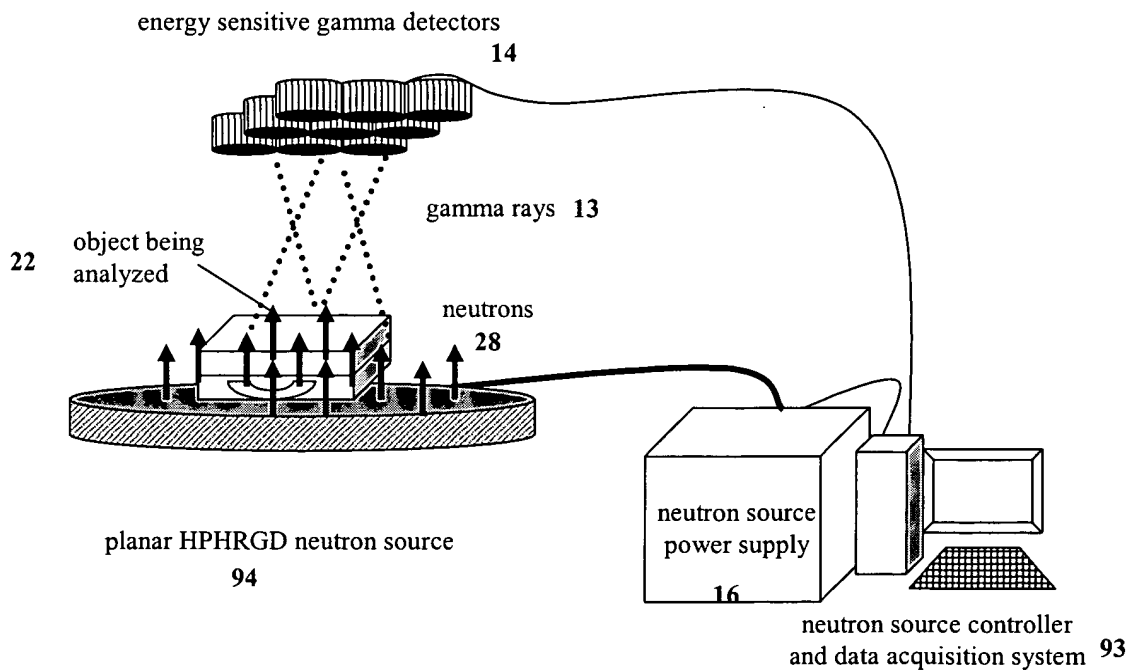


Fig. 44.

20221019 195800T

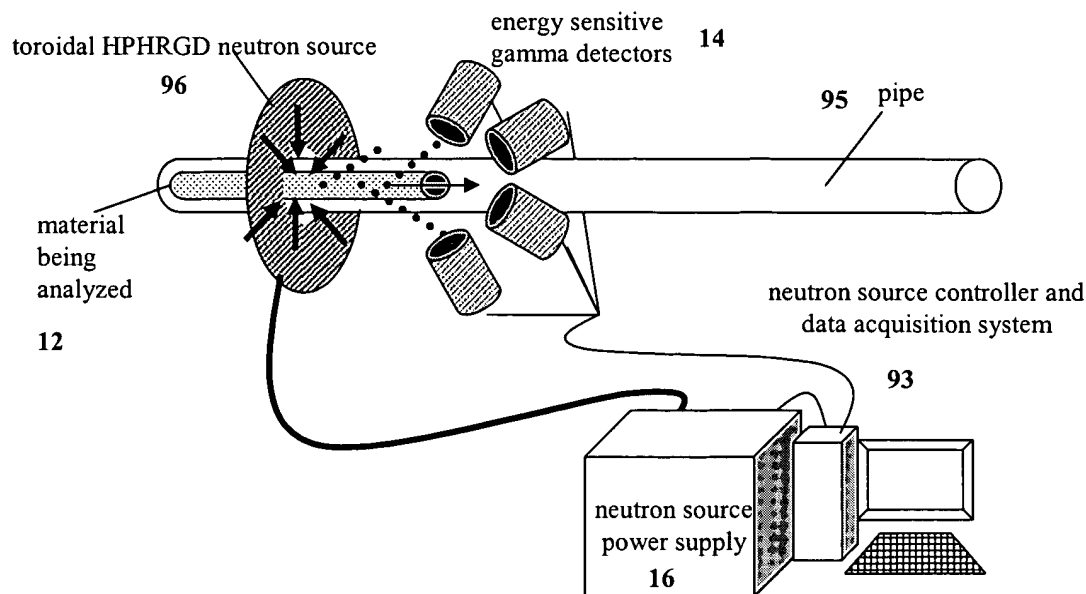


Fig. 45.

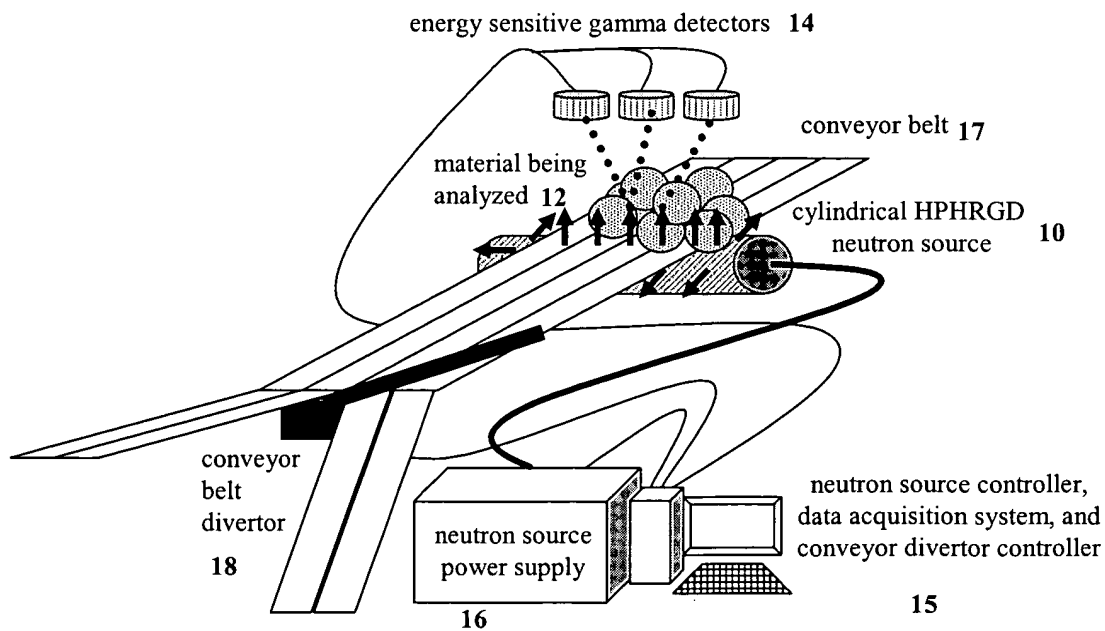


Fig. 46.

202501012002

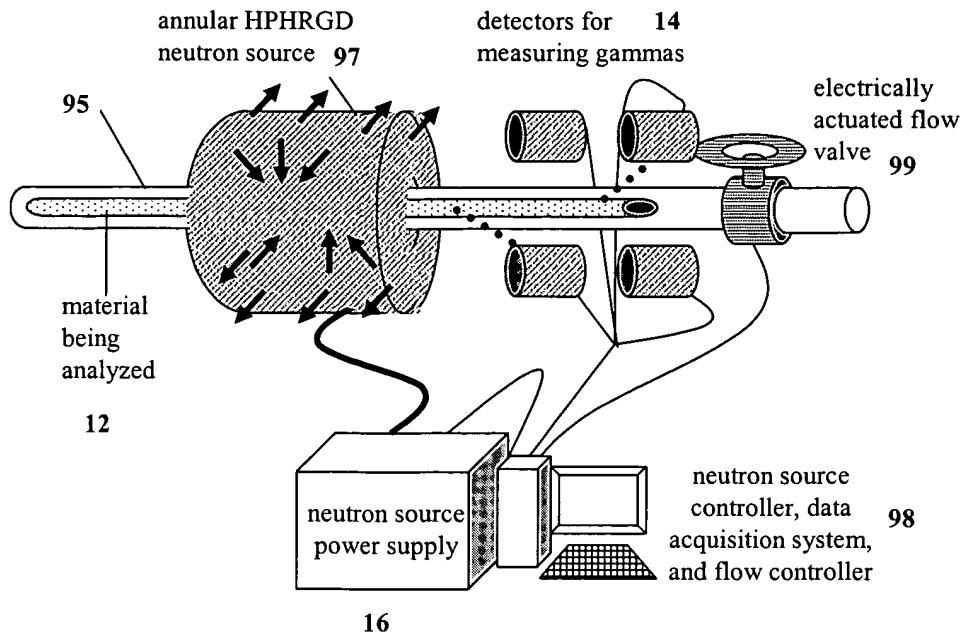


Fig. 47.

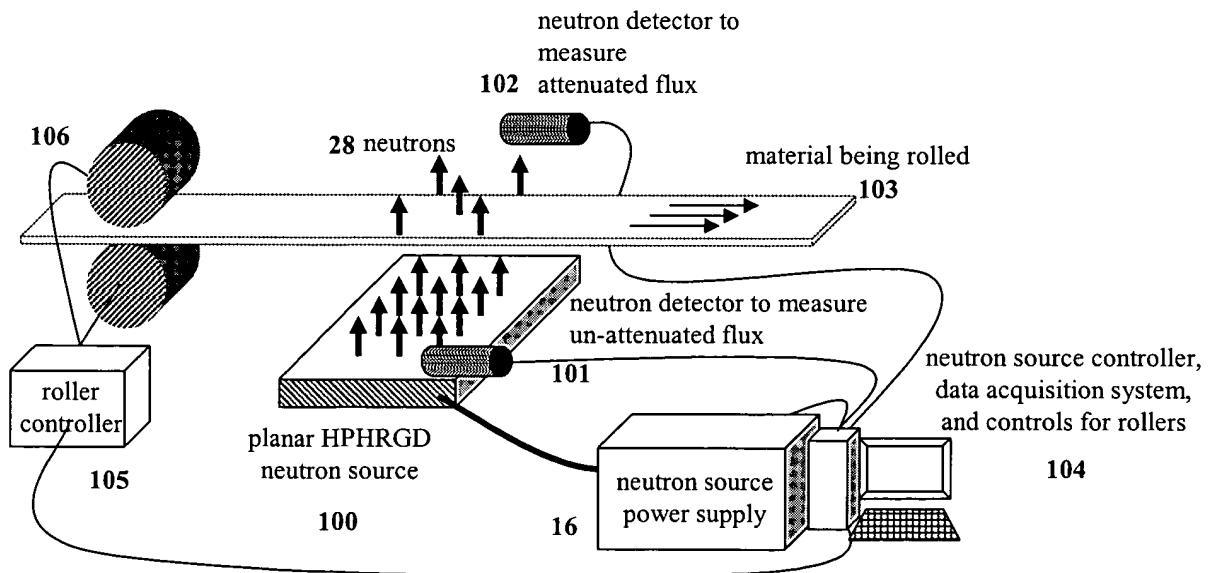


Fig. 48.

10058561-012802

10058561.012802
 20021019

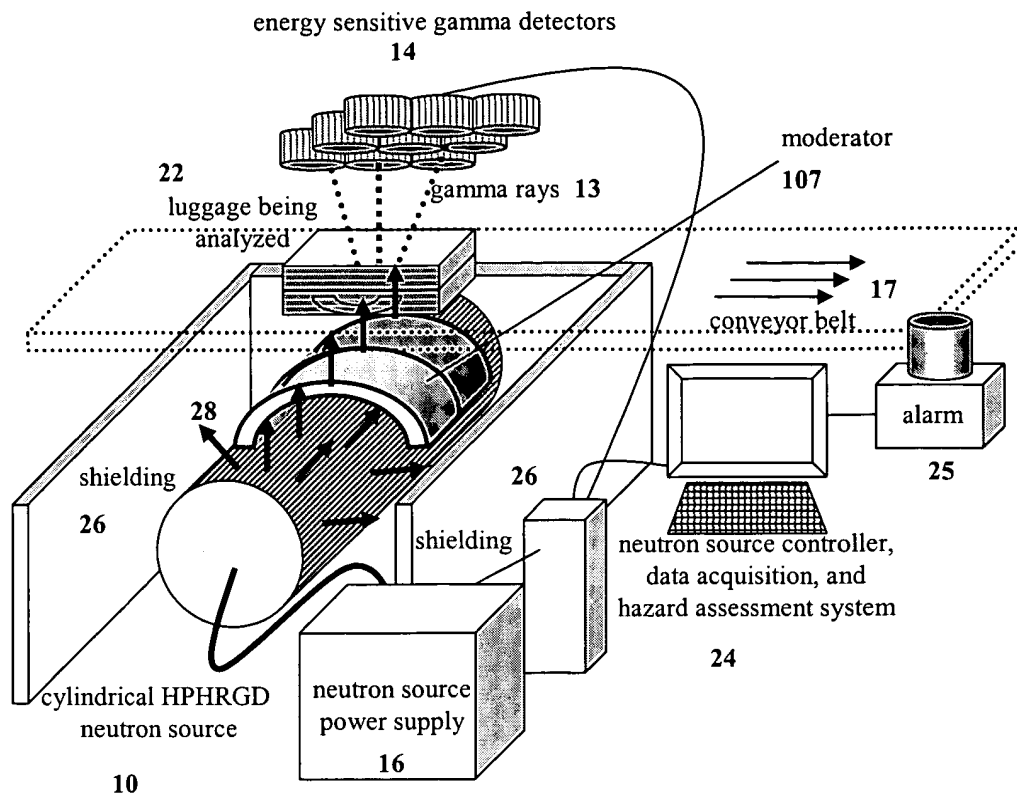


Fig. 49.

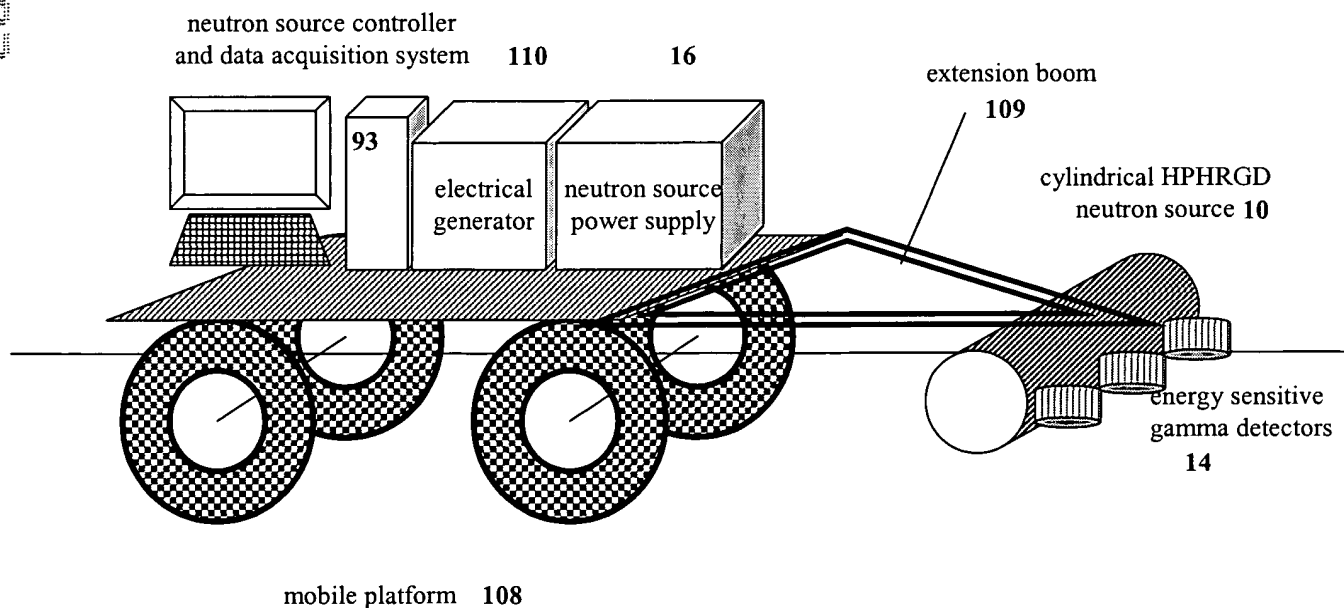


Fig. 50.

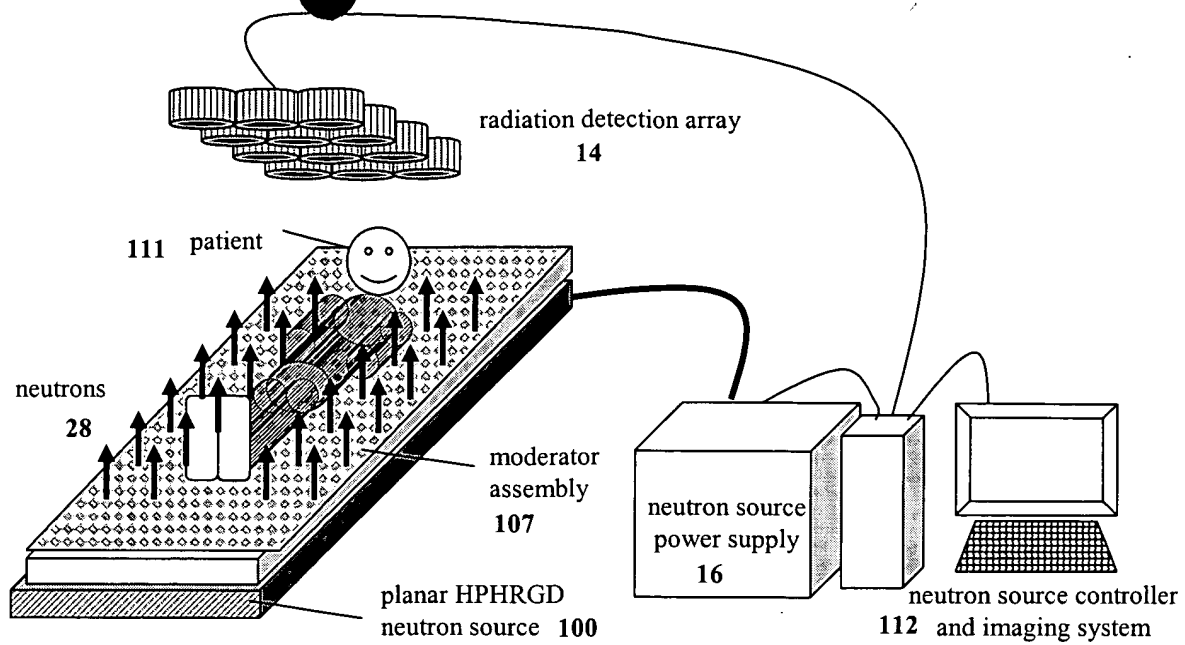


Figure 51.

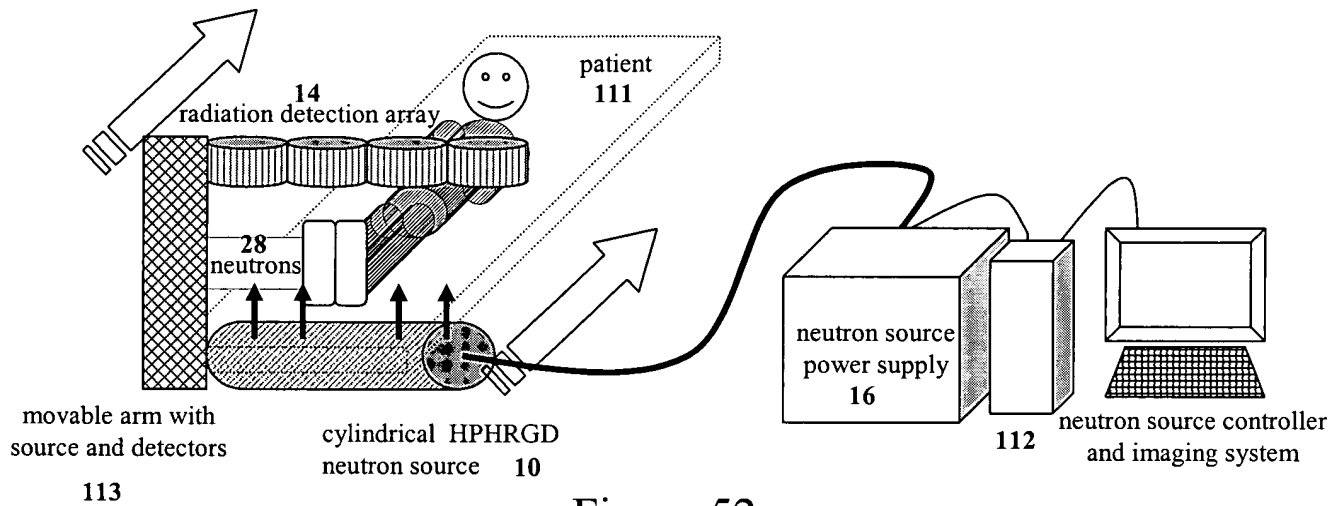


Figure 52.

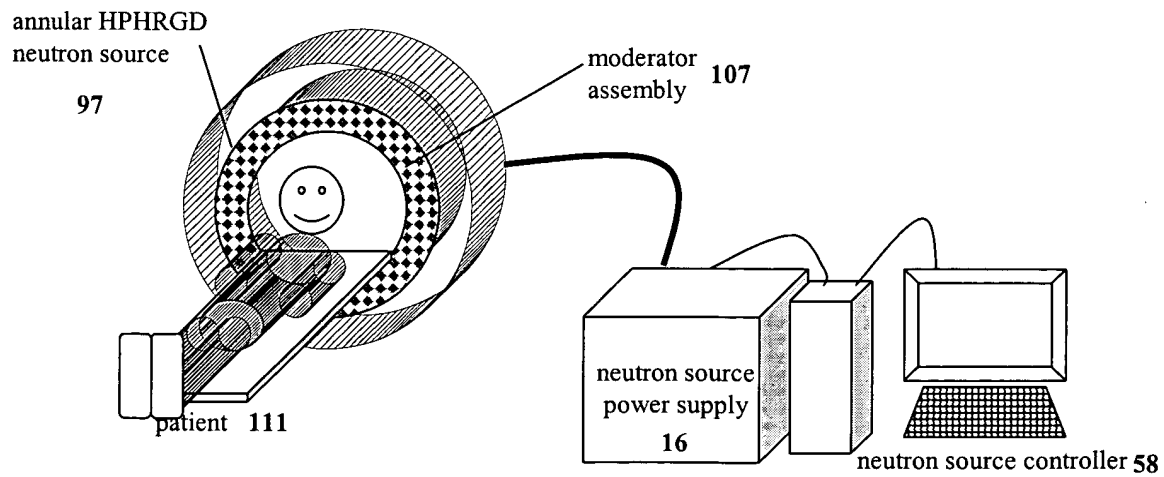


Figure 53.

2025-10-12 10:55:51

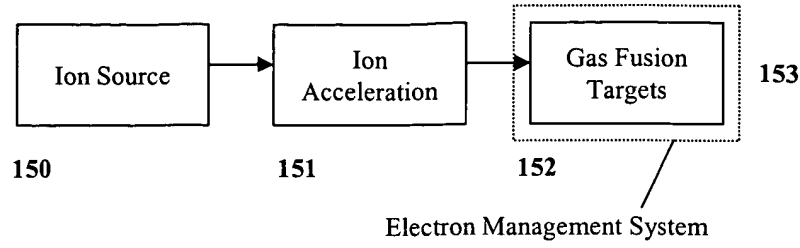


Fig. 54 (a).

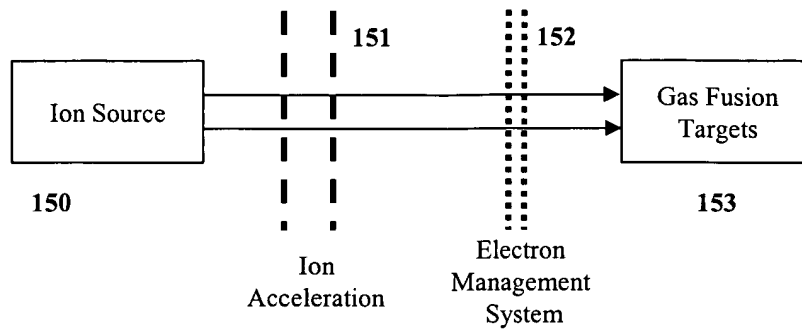


Fig. 54 (b).

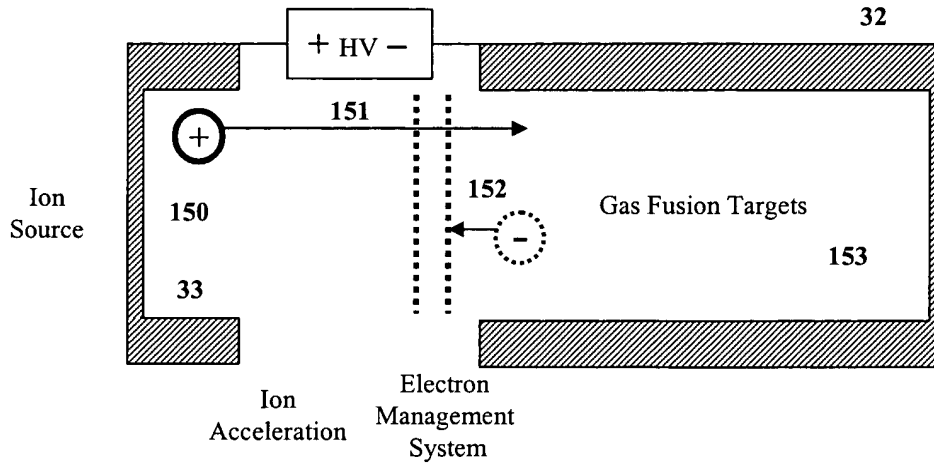


Fig. 55 (a).

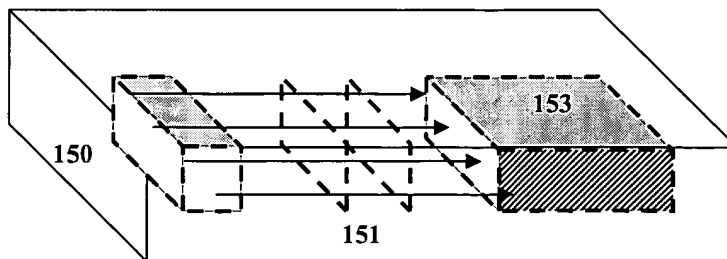


Fig. 55 (b).

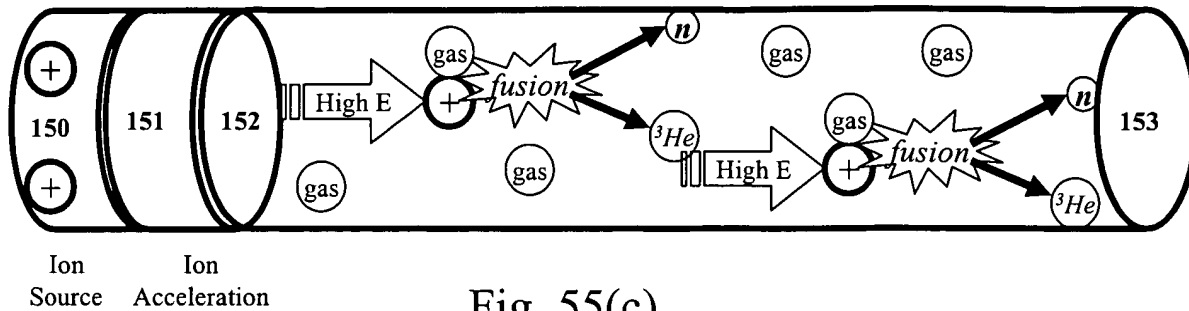


Fig. 55(c).

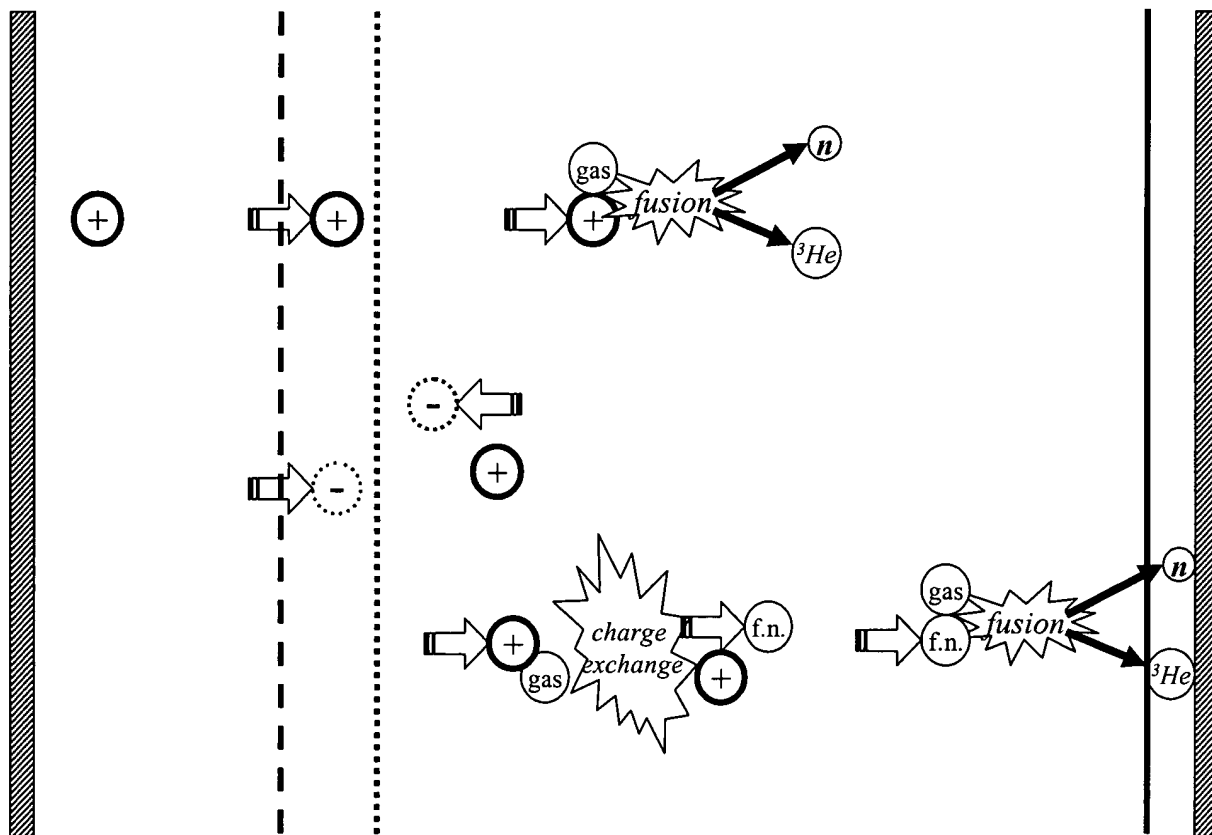


Fig. 56.

10058561.0128002

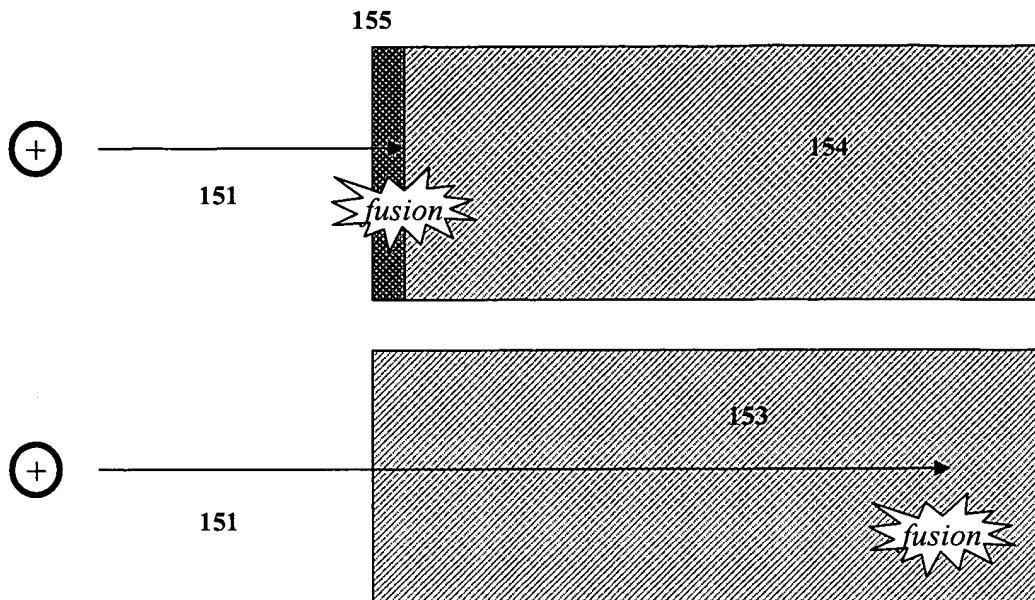


Fig. 57.

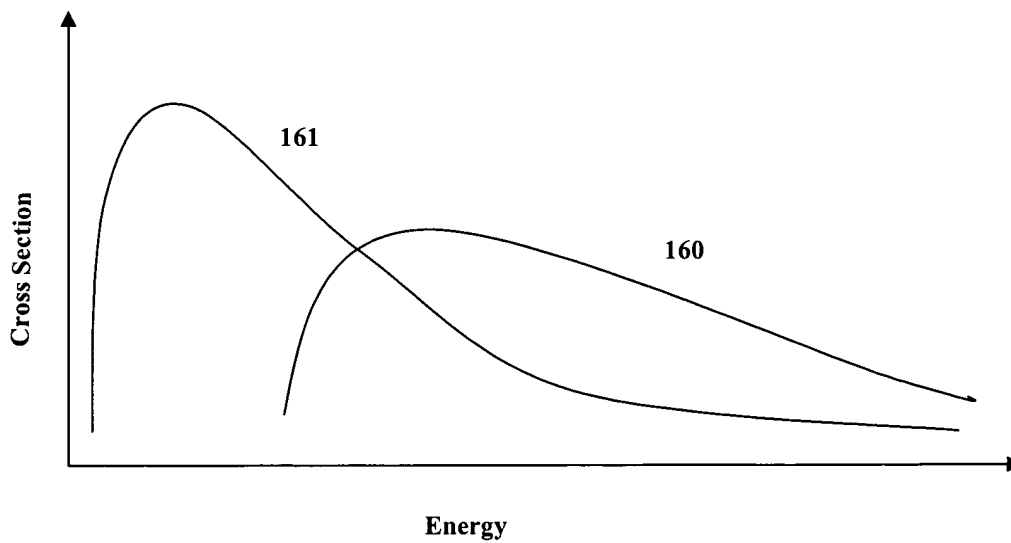


Fig. 58.

2025 RELEASE UNDER E.O. 14176

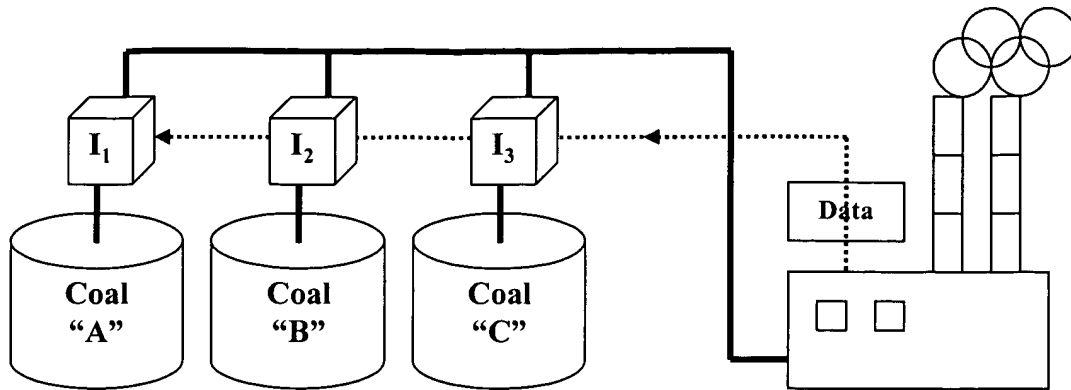


Fig. 59.

2025 RELEASE UNDER E.O. 14176